

JOURNAL OF THE American Veterinary Medical Association



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(Original Official Organ U. S. Vet. Med. Ass'n)

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The American Veterinary Medical Association by Pierre A. Fish, Ithaca, N. Y.

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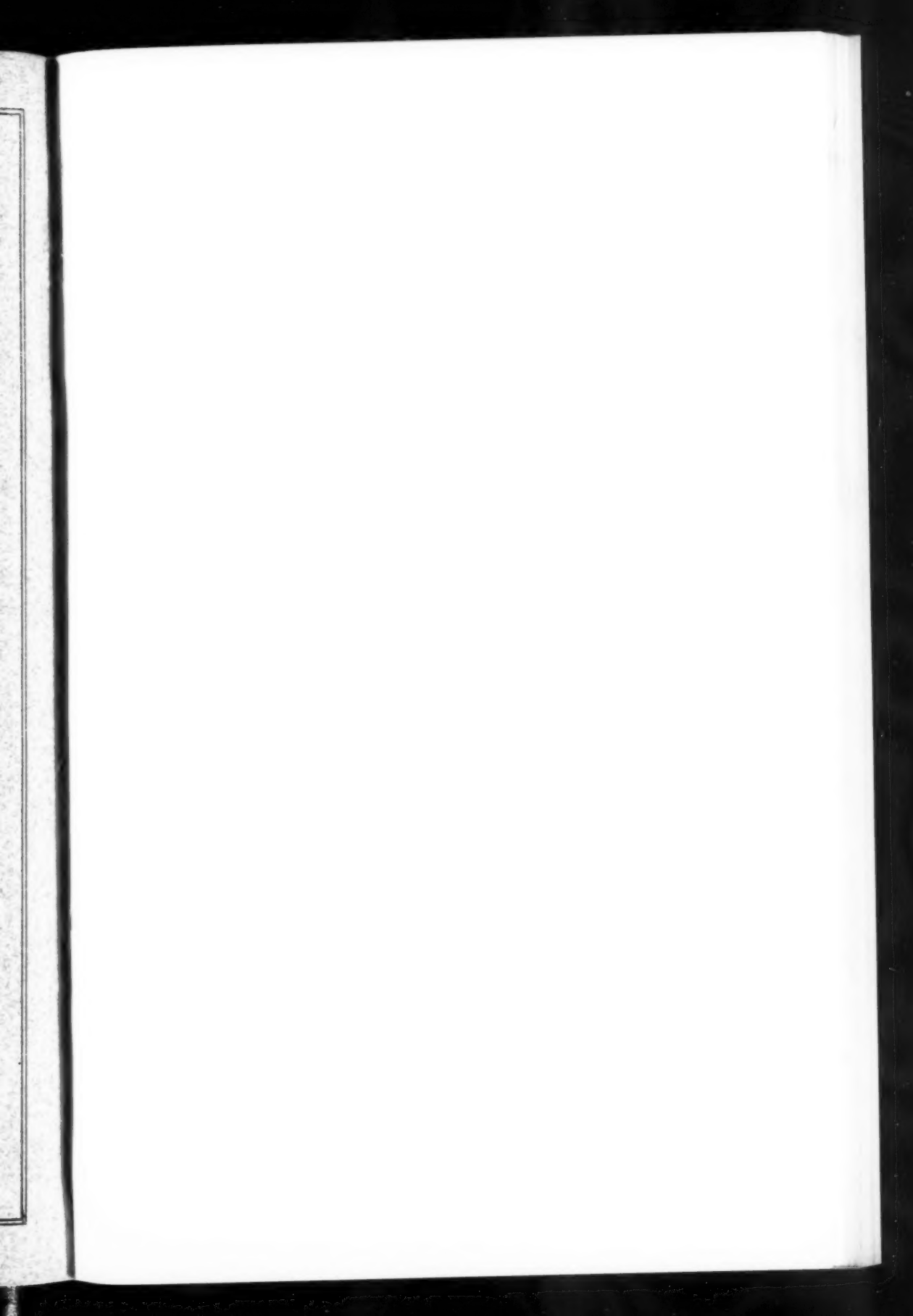
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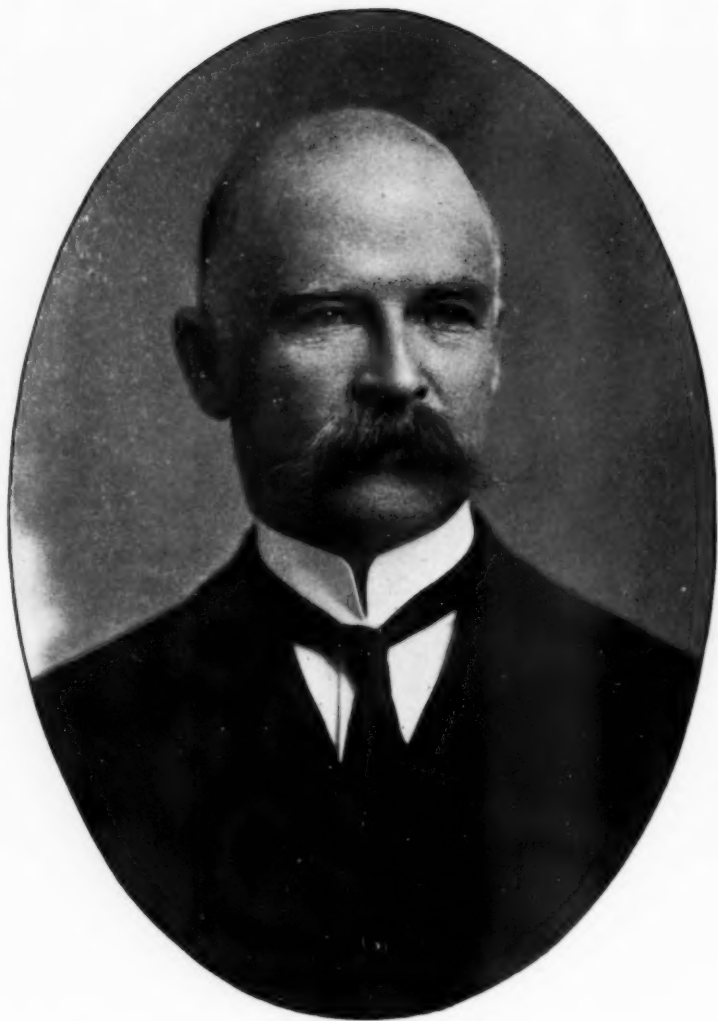
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President of the American Veterinary Medical Association 1917-1918

JOURNAL

OF THE

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PIERRE A. FISH, Editor

ITHACA, N. Y.

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No. 5.

Communications relating to membership and matters pertaining to the American Veterinary Medical Association should be addressed to Acting Secretary L. Enos Day, 1827 S. Wabash Ave., Chicago, Ill. Matters pertaining to the Journal should be sent to Ithaca, N. Y.

A MATTER OF DUTY

The President of the United States has recommended that, even in time of war, educational facilities should be maintained; that scientific and professional organizations should continue and perhaps increase their activities. The basis of this is doubtless the view that actual assistance is rendered the government, either directly in connection with the war or in the discussion and mastery of problems that will inure to the benefit of our country and thus indirectly assist in the war.

One of the important features of war is elasticity. Many are called from their usual activities for combatant purposes. From producers they are converted into consumers, with the result that more supplies are demanded with a diminished number left to produce them. This is the test of elasticity. Our productive power must be stretched to greater and greater limits as the war goes on. All of the fighting is not done at the front. We can all fight in one branch or another of patriotic service and to that every real American has dedicated himself.

Seventeen hundred veterinarians have been commissioned as officers and more will be commissioned as their services are needed.

Those remaining in practice have the opportunity of stretching their capacity to care for the practices of their colleagues who have gone.

There are veterinary problems concerned with the war and the welfare of our country which can be handled satisfactorily in an association meeting—which serves as a clearing house for ideas. Particularly is this true of a national meeting where representatives from all parts of the country are gathered together. This year, more than ever, and because of war conditions, especial effort should be made to attend the meeting of the American Veterinary Medical Association at Philadelphia. There will be an earnest effort to deal with problems that will benefit our country and help it to win the war. Philadelphia is the “cradle of liberty”. Its historic associations of one hundred and forty-two years ago have a peculiarly intimate relation with the principles involved in the present struggle, and make it a fitting environment for the annual meeting.

The American Veterinary Medical Association is clearly included in the President's recommendation. Its meetings are educational and its purpose is helpful and progressive. It is represented at the front, and three thousand miles behind the front it puts forth its loyal effort for the welfare and success of the great work in which our country is engaged.

The association expects every member to do his duty.

P. A. F.

VETERINARY RELIEF

If we visualize the struggle abroad as we should we shall become more and more determined and self-sacrificing for an allied victory. While our brothers and sons are giving their lives, we shall give our luxuries, our necessities, our money, our food, our comfort, our all, if need be, in order that those who have given more shall not have died in vain. We shall learn new lessons in the lavishness of our giving for the cause of humanity and civilization, and new lessons in self sacrifice in order that we may have the wherewithal to give.

Impossible things have happened and unbelievable crimes have been committed in the effort to torture civilization. The inhuman is differentiated from the human in that the former in-

flicts suffering while the latter alleviates it. The desire to extend relief is natural but the appeal strikes a little deeper, when members of our own professional brotherhood are affected.

We have known that the invasion of Belgium and northern France has separated and pauperized the families of veterinarians in common with others. We know that Americans have been and are assisting in the reconstruction of devastated towns and in the rehabilitation of the people. Aside from this general relief there should be special relief to the unfortunate but unconquered veterinarians. Special equipment is needed by them in the way of instruments, medicines and sundries essential for practice after their homes have been recovered, and special assistance may be needed even now to keep them alive until the invader can be driven back.

The first to appreciate the situation and to take active steps in assuaging the pitiable condition of our Belgian and French confrères was Alexander Liautard. At first there was established the Franco-Belgian fund. After the cooperation of the British in this work of mercy the title was lengthened to the Anglo-Franco-Belgian fund. Last year our American veterinarians quickly raised a fund of \$3000 at the annual meeting of the American Veterinary Medical Association, and the fund has now grown until it amounts to about \$4600. The title of the fund will not bear much further lengthening. In our tribute in the May issue relative to the death of Dr. Liautard, we stated that these funds stand as "a memorial to his great heart". As Dr. Liautard was, in reality, the originator of the fund in America, as well as in Europe, the thought was in our mind that it would be eminently proper to link his name with this great humanitarian work under the name of the Liautard Memorial or the Liautard Fund. To us it seems there is no better way to perpetuate the memory of this great and good man than to associate it with such a worthy cause. There need be no lapse in such a memorial. When peace arrives and we have done our duty toward our war stricken brothers, there may be worthy but unfortunate members of our profession at home to whom it might be applied.

Dr. Liautard's life was a life of service for his fellow man. Such a memorial would perpetuate his service and although gone from our midst his spirit would remain a living force in the ranks of our profession.

The suggestion of the use of Dr. Liautard's name in connection with the fund has been made independently of our own. At a meeting of the executive committee, of the European fund, held at Paris, May 8, Monsieur Rossignol spoke of the growing length of the title and suggested that it be abbreviated by the use of Dr. Liautard's name.

Efforts toward increasing the fund should not be relinquished. As the war goes on more and probably greater demands will be made upon it. Since our last annual meeting the northern portion of Italy has been invaded and doubtless a number of Italian veterinarians find themselves in the same situation as do the veterinarians of Belgium and northern France. As in France there may be some veterinarians in the uninvaded portion of Italy who may be in a position to assist those less fortunate than themselves and the scope of the fund thereby increased.

As the sending of only a portion of the American Army to the shores of France has brought cheer and renewed vigor to the allies, so might we expect that a portion of our fund placed at the disposal of the administrative officers of the European fund will bring renewed confidence and appreciation of our purpose to bear a share of the burden of rehabilitation and demonstrate that American veterinarians are second to none in responding to humanitarian appeals for aid to members of their profession.

P. A. F.

GAS MASKS FOR HORSES

Poisonous gas, one of the horrors of the war, introduced by the Central Powers, has taken its toll from horses as well as men. A factory in this country is now finishing 5,000 masks a day especially designed for the American horses and mules on the battle front and it is expected that soon all the transport and artillery animals will be equipped with this life-saving device. Although much of the hauling of supplies and ordnance is effected by motors, it has been found that the horse cannot be dispensed with and that the motors do not supplant but supplement his work. The dogs used in the service of the Belgian Army are also supplied with masks. It is a matter of profound satisfaction that these useful friends of man can be protected from one of the atrocities of the war.

RECIPROCITY AND EQUALITY IN VETERINARY INSTRUCTION*

H. E. BEMIS, Ames, Iowa

Since having opportunity to make a few first hand observations during the last few years in connection with the classification of students in veterinary medicine and the examination of graduates of various veterinary colleges for the Veterinary Reserve Corps, it has seemed to me there were at least three great needs in our educational system which are necessary to uniformity of product. The first as we are all agreed is uniformly high entrance requirements which should be not lower than graduation from a four-year high school which requires that at least a large proportion of time be devoted to the languages and sciences to the exclusion of agriculture taught from a text book by some lady who probably was raised in the town or city. We all recognize the value of agriculture in connection with veterinary medicine but not as a foundation for veterinary medicine when other subjects more important must be sacrificed.

To my mind, the value of a high school education is not wholly in the accumulation of so many facts, but in part is due to the test which is put upon a young man to finish his high school education. Many who take a short cut to college often do not do so from necessity but from lack of application and vision necessary to complete the course. Such a person can never have the vision of a professional man even though he may graduate from a veterinary college.

The second important step is to have sufficient uniformity in methods of teaching, in length of time devoted to each subject, and in sequence of subjects within the course so that students who voluntarily or of necessity change from one school to another, might be able to continue their course without loss of time or instruction. Veterinary faculties should agree upon what shall constitute a course in veterinary medicine which is worthy of the degree of D.V.M. and should agree approximately upon the length of time to be devoted to each subject and the sequence of subjects within the course. Time should be allowed for electives so that students, or

*Presented at the 54th Annual Meeting of the A. V. M. A., Section on College Faculties and Examining Boards, Kansas City, Mo., August, 1917.

colleges, who wish to emphasize certain branches may be free to do so. This would give individuality to colleges but would still provide the essentials in all and make reciprocity possible.

The third refers to greater uniformity of teaching talent and of methods of teaching within each college. Dean White of Ohio has made the statement, or at least quotes it, that there are scarcely enough good teachers in the country to man one veterinary college and we realize the force of the statement. A teacher should have teaching ability plus a broad general foundation acquired either by college training or natural inclination to study the foundation subjects. The final essential is a thorough *veterinary* education. The dean of a veterinary college should make an effort to develop all departments as equally as possible and to see that the teaching methods in each are as near alike as the nature of the work will permit. Examining students from various schools show that some schools are uniformly strong in some branches and weak in others. I believe there is too great a tendency to slight the foundation subjects and emphasize the more practical or more interesting subjects. A man nowadays should not be called a veterinarian who cannot analyze his cases from the foundation up if necessary. For instance, how can men practice successfully who, as shown by recent reserve corps examinations, never heard of the pododerm, who state that the superficial and deep flexor tendons are lateral ligaments of the shoulder joint, that the biceps brachii is the "motor engine" for the shoulder joint, and are unable to say anything more about it; who know nothing about the bicipital bursa and its diseases and cannot name the divisions of the intestinal tract? On the other hand, what are we to think of the veterinarian who may have a working knowledge of anatomy but knows nothing of the lymph system or the functions of the liver, except that it secretes bile, who never heard of malignant edema and always advises strychnine as a stimulant in cases of pneumonia? These statements have been taken from answers given in examinations and indicate either lack of capacity on the part of the student or lack of adequate, systematic teaching of both foundation and advanced subjects on the part of the faculty.

To summarize, the three needs are: 1, thorough preparation; 2, uniformity or standardization of courses; 3, better balance of teaching ability, and teaching methods within each college.

EDUCATION OF A VETERINARIAN*

E. L. QUITMAN, Chicago, Ill.

My position as a member of the Board of Examiners of the Veterinary Officers' Reserve Corps taught me much, and has made me ponder much, and has caused me to wonder how some veterinarians could learn so little in three years at college, and how others could "learn so little and forget so much" within a year or two after graduation.

I have examined men from nearly all colleges and find the same average condition prevails among the various graduates. This caused me to attempt an analysis of the cause of the deficiencies, and brought to my mind the question—is it the fault of the veterinary college, or of the individual? Aye, there's the rub—*yes* and *no*—it is.

The result of my analysis of the deficient are as follows:

| | |
|--|------|
| Poor or improper teaching methods..... | 50% |
| Deficient education of student..... | 25% |
| Deficient intellect (though educated)..... | 25% |
| Total..... | 100% |

So you see the fault lies half with the college and half with the student body.

THE REMEDY: First, closer lines on the entrance examination, a few less dollars each session spells a longer life to the private school; attention paid to the fitness of an intending student regardless of education.

Second, the teacher should be taught how to teach—I found in many cases that the graduates of a certain college were deficient in some certain branch or branches, while the graduates of another college were poor in other branches; this condition in the 50% of the cases put the deficiencies clearly up to the college—the teachers of certain subjects either did not command the respect of his students or he did not know how to sow his seed; how to drive his points home; how to make his subject impressive or how to make the more important parts of his subject remembered.

The really good teacher can make the least important subject appear as important and impressive as any subject in the curricu-

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lum and make his students remember the salient features—if he has the proper soil.

I would suggest that just at the opening of college sessions a meeting of the *entire* faculty be called and some member of the faculty or directorate, preferably the dean, if he is properly qualified for this function, deliver a lecture to the faculty wherein he will call a spade a spade, and call the attention of the individual members of the faculty to their short comings, then tell how certain subjects should be taught; how to make them impressive; how to lessen cheating in quizzes and examinations and finally inviting a free discussion of the subject.

I believe that frequent quizzes are of the greatest help in forcing neglectful students to keep up in their work and I suggest, in order to prevent students being helped or prompted by neighboring students, that the teacher leave his rostrum and walk down among the students, always getting as close as possible to the one being quizzed.

Those who have not tried this method can have no idea how much it helps the student and how much it will correspondingly add to the reputation of the teacher as a teacher.

And of almost greater necessity is the fact that freshmen should be taught how to study; they should be taught that memorization alone is not sufficient, but that correct study means a full comprehension of the subject. No words should be used that are not explained or understood by the student. I frequently ask students to tell me the meaning of certain terms they may be using in answering questions in my quizzes, and at the beginning of a session I find that commonly they do not know the meaning, then a nicely put "roast" and an explanation as to the futility of Poll-parroting follows, and in the future this rarely occurs.

The writer also wishes to emphasize the great necessity of *more practical* instruction and that the teachers at all times call the student's attention to the *practical* importance of the subject under discussion, remembering that the student is not in a position to always see this for himself.

More clinics should be given, and I am a firm advocate that a veterinary college should and is justified in advertising free clinic days for all animals, or better, a certain day for free horse clinics; a certain day for free dog clinics and a certain day for free cattle and other farm animals' clinic.

This method, of course, always brings out a storm of protest from the local veterinarians, as some unworthy people take advantage of these free clinics, which of course, should be for the benefit of the poor and care should be used to prevent the unworthy or able-to-pay people from taking such advantage.

With this discrimination always in mind, I would say that inasmuch as said free clinics would be "for the greatest good, for the greatest number" that no attention should be paid to such protests.

I would suggest that teachers frequently impress students, especially those of the graduating class, as to the necessity of reading and studying after their graduation, so as to keep up with the times, to impress them with the fact that a *month's* neglect in reading veterinary and medical journals and new or standard publications, may put them years behind.

Encourage them to form community associations with frequent meetings; for 'tis competition that spurs to best efforts.

The most potent and frequent excuse of the veterinarian for being "behind the times" and for "forgetting", is "isolation", alone in a country practice—and I know of no better remedy to remove this condition than community associations with frequent meetings.

THE VETERINARY CURRICULUM AND ARMY VETERINARY SERVICE*

JOHN P. TURNER, Washington, D. C.

A year ago, the consideration of this subject would have been considered by this body as rather superfluous, owing to the well-known attitude of many veterinary schools relative to their graduates entering the army veterinary service.

As far as the writer knows, only one school has given this matter any consideration whatever, and that was given in a short course of lectures, and was made possible by the proximity of a cavalry post, where army veterinarians were always stationed.

Without rank, promotion or organization of any kind, the army did not appeal very strongly to young veterinary graduates. Now that the results of our 25-year campaign for recognition in the mili-

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tary service, a fight started by the brilliant Huidekoper, has brought forth good results, it is high time that the profession and more especially the schools, should prepare their young men to meet the high requirements of this service.

The question is frequently suggested that there is no difference in the practice of veterinary medicine and surgery in the army and in civil life. The cause, symptoms, diagnosis, prognosis and pathology of disease is exactly the same for the same disease whether it affects the lowly mule of the poor negro cotton worker or the flashy charger of the General. The treatment and handling of the disease in either case by the civilian practitioner and the military veterinarian call for far different methods.

In the former case, severe criticism would be meted out to the civilian practitioner who fails to roll up his sleeves and get into his jumpers and hustle. For some reason or another, probably military, the same procedure would be somewhat criticized in military practice, where in many cases it seems to be the rule to make the other fellow do the work.

The writer remembers very distinctly a severe reprimand given by a very strict old colonel of cavalry, who entered the post veterinary hospital and found the regimental veterinarian drenching a horse, instead of ordering a somewhat stupid farrier to perform this work.

Then again, there is quite a large amount of work such as the handling of contagious disease, which is handled somewhat differently in the army than in civil practice.

In civil practice, these horses belong to an owner or firm who may or may not follow your advice as to the handling, treatment and isolation of horses with infectious disease, and disinfect their barns according to their own primitive ideas and methods, in spite of the efforts of the attending veterinarian.

The only satisfaction received by the attending civilian veterinarian is in receiving more fees for another outbreak in the near future, due to faulty methods of handling and disinfecting. This condition does not apply to the army man, where absolute efficiency is expected and required. It is expected of an army veterinarian that he can teach hippology and be a horse master. Where does, or where can, the veterinary student get instruction in the colleges to prepare him for this work?

The writer found shortly after his entrance into the service

that he must prepare for work far different from that expected of the civilian veterinarian, and along many lines that were new and unfamiliar to him.

As early as 1884, the late Dr. Rush Shipper Huidekoper realized the necessity of a trained army veterinary service, and began his effort in its behalf and never ceased as long as this brilliant man and prodigious worker lived. Having been trained in the great Alfort school of France, it was only natural that he should look on the military aspect of veterinary training. Horsemanship, zoology, zoo-technics, especially as related to the horse as a military animal, all appealed to this wonderful man, and in turn he did his utmost to impart his knowledge to those fortunate students of the classes of 87-88-89-90 at the Veterinary Department of the University of Penna.

It is doubtful if many of them realized the ideals of this man or the reasons that caused him to devote so much time and drill us in the subject of zootechnics.

Those of us who for shorter or longer periods entered military life, realized at once the importance of this great teacher's work. Taking us back into the dawn of animal life, he gradually brought the development of the horse into his present usefulness. Then he lectured on horse breeding, equitation (both theoretical and practical in the ring); the importance of physiology, and hygiene in veterinary practice were continually rung into our ears, and later the control of contagious and infectious disease among animals. Quarantine—shipping by rail and sea—all of these were comprehensively covered by this teacher. Those of us who have wrought with what he taught many years ago hold this great man in the highest veneration, and realize that his untimely death was a great blow to the development of the military side of our profession.

If our colleges are to meet the requirements of the army, what must they do?

First: the matriculation examination must be so high that only men of broad education and brains big enough to absorb knowledge should be entered. Army officers, either from the military academy or in the staff department, are educated men and there is no place officially or socially in the service for the uneducated or narrowly educated veterinarian.

Second: after the first two years of study in the veterinary colleges, the specialization work should commence. The sooner our profession realizes and acknowledges that this is the day of special-

ties, the sooner we can properly train the young man for his life's work. The man who is preparing to enter food inspection work in the Bureau of Animal Industry or dairy farm inspection work for municipalities needs all the instruction he can get in pathology, hygiene and animal husbandry.

The student who is specializing for bacteriologic work should have his special work mapped out for him.

Likewise the general practitioner and surgeon.

The student preparing for army service should primarily be a horseman and horse master, and in the line of such work, he should receive lessons in equitation in either the veterinary or riding school. Then should begin his special training. Hygiene and then some more hygiene as laid down by the illustrious English teacher, Gen. Fred Smith, himself a distinguished army veterinarian.

Feeding, watering, ventilation and construction of stables and veterinary hospitals should be given special consideration.

The examination of feeds for quality and molds; the study of water supply and its origin.

Students should be instructed in the general rules of construction work and the proper shapes and locations for stables. Ventilation should be thoroughly given and special training as to ventilation on shipboard. The feeding, watering and care of animals on board ship should receive consideration.

Instruction in horse shoeing, now given in many schools by lectures only, should be given by practical instruction at the forge with the actual making of shoes and shoeing of horses, such training as was given in one of our schools 30 years ago.

The recognition and control of contagious diseases among horses, mules and food animals should be thoroughly taught by both lectures and practical field work. The instruction in the control of contagious diseases should be very broad and comprehensive, and should begin with the transportation of animals from the farm to the markets.

The control and disinfection of horse markets, railroad cars and dealers' stables should be given close and thorough study and attention.

Veterinarians should be instructed in the proper classification of sick animals for isolation and treatment; such work could be given in the form of military problems and taught to students as other military problems are taught to military students.

Some may object and say that these subjects are more properly the work of post graduate or army service schools, and very probably they are, but in the absence of such institutions, and in the present great need for veterinarians with some military knowledge, the schools must do their best to give the students the best they have with the limited facilities on hand for such instruction.

Army veterinarians act as instructors of hippology to the young cavalry and artillery officers. Such a position requires that a man be broadly educated and at home in the lecture room.

The word hippology is very broad in its meaning, and doubtless every veterinarian has his special ideas as to the subjects that should be taught.

The writer suggests a course somewhat as follows:

- (1) The origin of the horse and mule.
- (2) Genus, species, families of the Equidae.
- (3) Gross anatomy of the horse. This should be given along broad lines, such as showing the actions of different groups of muscles. The bones, especially of the leg and foot. The special anatomy of the horny box of the foot. The anatomy of the mouth, in order that the physiology of biting may be understood. The anatomy of the shoulder in its relation to draft and the anatomy of the withers and loins, in order that the physiology of saddling may be understood.
- (4) The mechanical principles involved in biting a horse and the measurement of horses' mouths.
- (5) The construction and fitting of military saddles and packs, showing the relation of saddle pressure to the muscles, and the relation of the bearing points of the saddle to the ribs.
- (6) Watering, feeding, ventilating, drainage, lighting and general construction of military stables.
- (7) Judging feeds.
- (8) A short course on digestive troubles of the horse, showing the relation of the anatomy of the equidae as a predisposing cause of colics.
- (9) Contagious diseases. How recognized, and the general rules of sanitation and quarantine.
- (10) The treatment of wounds, sore backs, and shoulder, and the prevention of the latter by properly fitting saddles and collars.
- (11) Instruction in plain horse shoeing to both officers and enlisted men.

(12) Writing proper descriptive lists of horses. Text books recommended: Smith's Veterinary Hygiene (Gen. Fred Smith). Gen. Fred Smith's "A Manual of Saddles and Sore Backs". Henry's Feeds and Feeding. Fitzwygram's "Horses and Stables". Smith's (Gen. Fred Smith) Veterinary Physiology.

DISCUSSION

DR. QUITMAN: When I was examining these fellows who were anywhere from a few months to fifteen years beyond their graduation, I thought I could see them from the view point of the State board examiners, and I have said and heard said "how did so and so ever come out of that school"? I don't blame some of these State board examiners for some of the ideas they have on the subject.

I have to say that in my paper—Dr. Bemis' paper was very much along the same line—it seems we advocated a well-rounded faculty resulting in a well-rounded graduate. I want to say this in view of some of the things that were said in Dr. Turner's paper. I do not believe, however, it lies within the effort of any veterinary college to turn every man out a specialist in every different branch. Dr. Turner evidently sees the veterinarian only through the army eye, while Dr. Bailey, in his paper, sees the veterinarian only through the eyes of a milk hygienist. It certainly would mean about a seventeen-year course to follow out the ideas of these two gentlemen, if every specialist had the same idea. In human medicine they do not turn out specialists. If a man wants to specialize in human medicine he has to continue his studies after he graduates. If he takes an engineering course he cannot always specialize from the general course in engineering, but after having completed that general course he becomes an electrical engineer or a civil engineer, as the case may be. I think it is asking too much of a veterinary college whether it be a State university or a private school, to turn out men who are specialists in every different branch.

DR. HOSKINS: I was impressed, in listening to Dr. Bemis' and Dr. Quitman's papers, with their several points; one was in regard to what the high school represents in the entrance examination. I have had considerable experience upon State boards, and for the last six months I have had experience in dealing with a body of students in a State college that holds the highest entrance requirement of our country. You know in New York State we have nothing to say about the requirements of men entering veterinary schools there. The Board of Regents establish the requirements for us. They require that they shall be graduates of four years of high school work and shall have seventy-two counts; and I am not yet convinced that high school requirements will solve the difficulty that we have been contending about for a good many years. In all large cities like the City of New York, the high school there does give a very wide lati-

tude of instruction; but I have been disappointed considerably by the fact that many of these men that come to us with high school entrance requirements are still very lacking in the proper knowledge of the fundamentals. I have marked a good many papers in my time, as a member of the State board, of men who came to the college without the need of any entrance examination, but with the qualifications of high school men. I have been quite disappointed in a reasonable per cent of those men that they did not write either an intelligent paper nor were they able to write correctly or to express themselves in their papers grammatically. In large cities the whole trend of high schools is to fit men for commercial pursuits. I glory in the address of the president which we listened to this morning, because I always admire the man who preaches the gospel of discontent, since he is sure to get somewhere; while the man who preaches to those who listen to him that they should be contented with their lot does not get very far and in fact has commenced to retrograde.

When men come to us in our veterinary schools in great states like that of New York, or a great city like New York City, they come to us lacking, to my mind, a very essential thing to make a well rounded veterinarian. They come to us from back of counters or from desks in counting houses; they come to us from the great commercial industries of the cities, from the stores and other places, without a particle of knowledge of animal industry, with no knowledge of farm life, with no particular love for animals, but too many of them come to us with purely a commercial thought in mind. It is one of the difficult problems to eliminate that from these men's minds, and I have decided that this year, in opening the four years' course at the New York City Veterinary College, from the 5th day of September to the 26th day, we will devote that entire period with the four classes, teaching them and getting into their minds the thought that the field of veterinary medicine is not a commercial one, but is one of service—of service to humanity, of service that will bring them a rich reward in a feeling when they have closed their career that they have been helpful to mankind, that they have done something to lift the burdens off the shoulders of the great masses of people, and done something for what our president has spoken of, a world-wide democracy based upon a world-wide christianity. And so I feel today that we are not going to solve all of the problems by demanding just a high school entrance to our veterinary schools, nor are we going to make the well rounded veterinarian that Doctor Quitman has so practically pointed out.

Another point that we might take notice of from our president's address is that we must realize the importance of maintaining our courses in keeping with the courses of engineering and with the course of human medicine. We cannot hope, understand, that the future of any of our men can have the possibilities of engineering that oftentimes brings great fortunes over night, nor the possibilities

of human medicine in the great cities where men command as much as \$500.00 to wait upon the birth of a child on Fifth Avenue, or perhaps on Walnut Street of Philadelphia. Our men are going into a field that only promises perhaps with care and frugality and thrift a competence in old age—not riches or affluence; and we, who are engaged in the teaching of veterinary medicine, we who are trying to lift up veterinary medicine and build it up as we should must take into consideration, in dealing with student bodies, this phase of it.

While I am desirous of moving just as fast as we possibly can I am not unmindful that there are barriers to veterinary education, that locality and geography have to be considered. There are advantages enjoyed by the State schools in the agricultural districts over those in the large cities, and so it is a great subject that we ought to approach and deal with in the most thoughtful manner, lifting up every department of veterinary medicine and learning that it is possible to do; being careful not to destroy anything that has served us well in the past though perhaps not as fully as we would like, in the field of veterinary medicine in North America.

DR. S. STEWART: In some of the states, as you have heard today, a graduate of the veterinary college is granted a license to practice upon presentation of his graduation certificate or diploma, which is recognized by the State board. However, in the State of Minnesota they do not recognize anybody's diploma other than to the extent that it makes the holder eligible to enter the examination for a license to practice. The peculiar state of affairs as developed in Minnesota, in that particular, differs from any other State board of which I have knowledge, in that they believe it their duty to examine the candidate's basic educational qualifications as well as his scientific qualifications. The fact appears to be that about eighty per cent of the men who have appeared before that State board in the last two years have failed to pass, largely because of their failure to meet the basic educational requirements as set forth by that board.

If the proposals in part as set forth in the secretary's report as coming out from the Detroit meeting, that State boards should permit reports of their examinations to be made from which might be collated data to be sent to the various colleges so that they might be informed as to what the State boards demand from graduates of these colleges could have been carried out we would have reached a little farther along the road of progress. However, when I come to the examination of the Minnesota State board, the best they will do is to give the names of the men and the subject in which they failed. I sought through different channels to get a set of questions submitted to these men so as to ascertain upon what probable basis they failed and was told by the secretary of the board that it was contrary to the rulings of that board to send out any of the questions used by that board. Thus it is a closed corporation so far as general information is concerned.

My feeling is that colleges have stepped along pretty rapidly, but they have not realized nor felt the force of their own defects, and that the State examination boards have the opportunity, when they shall all correlate their efforts as a body in veterinary education to lead the veterinary colleges to a better comprehension of their short comings and in a measure make a potent source of information to those colleges that must necessarily make for better things for their graduates who are asking to be granted licenses in the respective states.

If the State of Texas holds an examination that you would say was primitive and the State of Massachusetts holds an examination that you would call super-technical, you will see the great difficulties that the colleges labor under when they feel that they must in some way prepare students to meet the varied demands of these State examination boards.

State boards have been guilty in some instances of some peculiar, eccentric catch question and they have been guilty of asking or propounding questions on theories that have long ago been exploded. They are not aware of that fact and are not up to where they ought to be. They ought not to complain of the veterinary colleges as failing to prepare students to answer questions of that sort in this day of advanced veterinary progress. One professor in a State college remarked to me one day that he considered it his business to give the graduating class under his care a series of instructions as to how to answer catch questions propounded by State examining boards, including in that a vocabulary which some State boards now use but which is antiquated and which the student did not get in the regular course.

All that sort of thing can be eliminated if the State examining boards will get together actually and discuss the features of the examination which it is possible for them to give under the laws of the State under which they are operating. If they will prepare and edit a series of questions as samples or guides for boards from which State boards may prepare their examinations, it would be of great service. Some of these State boards have very little experience—the State board of Texas has had possibly two years' experience and it is made up of men who never did any teaching, and who have no ideas concerning the work of instruction. They may never have prepared a set of questions and may not know the difficulty of making questions perfectly plain; may know nothing of how to equalize the value of various questions in the various departments, which is a very serious trouble indeed. I believe if it were the province of this body to prepare such sets of questions and offer them as suggestions of what kind of questions would be proper questions and such as would be fair to the student preparing to apply for a license, and which would be just as fair really in the State of Texas as in the State of Pennsylvania, it would be of very great advantage. We

find at times such peculiar questions propounded by these State examining boards as to describe the hearts, lungs and liver of a horse, for one of ten questions in anatomy, the others of the ten being about equally as broad. You can readily see how a man might spend a great deal of time trying to write out an answer to a question of that kind.

Just one more matter, and that is, whether State examining boards might not develop the student's knowledge by a practical examination as, for instance, if they should require him to pick up a horse's foot and examine the bottom of it and show that he knows how to go about his business; so that they could ascertain whether he could really put a bridle on a horse or whether he knows about harness and how a double-team harness was put on for instance, so that he would show the examiner by his methods that he knew what auscultation and percussion really means and what might be learned by them. In that way the examiner gets a definite notion of whether the student knows anything about the theory practically applied. Here is a great field which has been left uncovered. There is good ground for complaint because of our failure to publish our proceedings promptly and distribute them to the various State board members and various college faculty members. Some of these proceedings relating to State examining boards might be in a measure resurveyed yet and properly edited and serve a very good purpose. They ought to be printed in convenient form and in a sufficient number of copies to supply the new incoming boards of examiners, because there are fifteen or twenty every year entering upon their duties without any personal understanding of the obligations they assume. When we do that the State examining boards will begin to comply with their duty and then the veterinary college will begin to do things it has not yet done to prepare men to be practical veterinarians.

DR. DONALDSON: Dr. Stewart had something to say about the Minnesota State Board, and its refusal to grant him copies of the questions. I wish to say that at the meeting of the Minnesota Veterinary Association Dr. Kinsley was present at one time and I myself instructed the secretary at that time that he could hand to Dr. Kinsley, or any other representative of any college there, a copy of those papers to see whether there was a catch question or an unfair question in the whole thing. Dr. Kinsley, I think, had an opportunity to look at some of the papers and admitted that there was not a question in those papers that a young man coming out of a college ought not to be able to answer. We claim that we never allow catch questions in the Minnesota board examinations. We follow closely the rules of the civil service examination. We examine by number only. No member of the examiners, until the papers are all in and gone over, has any way of knowing whose papers he is examining. Those numbers are not opened until after that time. We have no reason

one way or another to hide our questions; but we certainly did not want to hand out a whole batch of questions extending over a number of years. That would certainly be a foolish thing to do. Then the prospective candidates could go to work and post up along that very line with very little knowledge of anything else behind it.

In regard to the Minnesota examination board's putting up an examination in preliminary education, I assure you some of the answers we get and some of the papers show that it is very necessary. I do not want to be very specific in this, but it is plainly evident that something is needed along that line. Not very long ago I had the 1917 prospectuses that were sent out to me from the different colleges, which tell what their entrance requirements are. One thing I want to say is, that judging from what we get in Minnesota, some of those colleges are not coming up to what they say in their catalogues. They could not be, or we would not get men like that coming out of those colleges. I am not here to criticize or tell what ought to be done. That has been spoken of enough already. There are institutions that are not examining their men properly before they go in. I am not advocating a high school education. As far as I am concerned I do not think it is necessary. Dr. Hoskins covered that beautifully. I think, however, there ought to be a line drawn as to where a man ought to have education enough any way to understand the language that is being used in the college; and I think he ought to have enough education so as not to come up to the Minnesota State board and spell such words as stomach "s-t-u-m-i-k".

I haven't a full copy of a set of questions in my pocket, but I have a few of them that I am willing to hand over to Dr. Stewart or any other college man, and let them look them over; and if there is an unfair question or a catch question or anything of that kind I would like to find it and we will have such things eliminated.

DR. S. STEWART: I am very glad indeed I said some of the things I did, because it brought the remarks we have heard from Dr. Donaldson. It also brings to mind several other little things. Personally I did not wish to intimate that the State of Minnesota asked catch questions, and I did not have that State in mind when I made the statement. It was an eastern State. I have no way of knowing whether Minnesota has catch questions or not, because I never saw their questions; but what I most desired was a set of questions on the basic subjects and to get an inkling of what examination they give, not in criticism of the board, but for enlightenment to myself and our faculty. That is why I wanted them.

In relation to this matter, I met a man on the street in Minneapolis in July who was a graduate holding a degree of veterinary medicine from the Kansas City Veterinary College, two years ago last spring. I met him and inquired how he happened to be in Minneapolis. He said, "I have just been here to take the State examination again", and I said to him, "How many times have you taken that State examination"? He said "This is the fourth time"

I got a record that he took the examination and failed and he told me that he failed every time on the basic examination, but that he hoped this fourth time he would get by. I looked up his record and found he entered the Kansas City Veterinary College with a high school diploma credit and never was examined here. Looking up that same record I found another man who said he had never had any high school training at all but who took the examination and passed with a good grade on every subject with the State of Minnesota board, where the other man had failed.

DR. DONALDSON: Was he a graduate of a Minnesota high school?

DR. S. STEWART: No. That brings out the point that Dr. Hoskins made that a high school course—particularly two years, or even three years in the high school—is not all the basic education that a man needs to prepare him to pass a first grade civil service examination or the examination given by some of the veterinary colleges.

A man who can pass an entrance examination such as the Minnesota State board possibly gives today, but who has taken a course of veterinary medicine and has undertaken to jot down by rapid notation what the instructors say is very likely at the end of the course to be a poor speller. They do not write any word hardly in full. They do not have time, but must abbreviate and find short ways to spell the words, right or wrong; and that is possibly some explanation of the condition we find. I am not offering that as an excuse for it, but as an explanation. In my own practice I tell the student never to take a note. Listen and digest what is being said and then go to the text book and read and he will read it more intelligently and don't spend time writing out what I am saying because they are not good enough short-hand reporters to take it down rapidly, and I think the results are less satisfactory. All men do not view that work as I do. However, it is my experience that men do take short cuts in their spelling and the tendency of rapid note taking is to make them defective spellers, even if before they were reasonably good.

There is another point of course that in taking an entrance examination a man may pass 50 on spelling and 90 on arithmetic and the average gets him over, and he never does become a good speller; or he may spell 90 or 95 but his writing is almost illegible, and he never does become a good writer during the course of the instruction. We have many difficulties, as Dr. Hoskins has said.

DR. S. L. STEWART: I was very much interested in Dr. Hoskins' talk about the qualifications of men who make application to a college for entrance. We have had high school men who were the very poorest students you could attempt to teach; and I have in mind one in particular. Not so very long ago this man could not pass the final examinations in one year. On the other hand in the same class was a fellow that really had trouble to pass the entrance

examination to get into the school. The fellow that had the trouble in passing the entrance examination came out at the end of the year with good grades, while the other fellow who came in without any examination because he was a high school graduate did not pass. Of course, you understand, these are exceptions; but they are the facts.

I hope to see the day when all the States in this country will have the same rules for their examining boards or give practically the same examinations that Minnesota does, because in doing that it is going to make the colleges compete on their entrance requirements. I have said, and I still maintain, that I do not see any possible chance of the State examining boards ever getting anywhere near each other or giving examinations which are any where near equal unless some reciprocity be brought about. Wherever the B. A. I. examination could be substituted for the State board examinations, it would be a good thing. That would give the man in Missouri and Connecticut and Minnesota a chance to practice without taking an examination. As it is now if a man moves from one State to another it is up to him to take the State board examination in the State to which he goes, and you gentlemen know that when a man is out of school fifteen or twenty years, even though he is a good practitioner and even though his grades may have been in the nineties, when in school, it will hustle that man to take the State board examination in any State, although he may be one of the best veterinarians. I would not want to go to Minnesota to take an examination, because I have been too long away from these studies; and that is why a good many fellows would like to see reciprocity and an effort toward uniformity and standardization if there is any way of bringing it about.

Again bringing up the subject of passing examinations, if you will go to the records of the students in the public schools and in the high schools you will find very few good spellers. They are exceedingly poor in spelling and in clear handwriting. I don't know how a veterinary college is going to turn out men who are good spellers and good copywriters unless they have attained these accomplishments in the public and high schools. It is a surprise to see the words that a high school graduate will mis-spell, and it is surprising to know that few people can really write a clear copy hand and make a correct copy. I think those things ought to be corrected in our public schools and in our high schools. I cannot see, for myself, why State boards require men to pass a certain high basic educational examination when these things never were taught them.

DR. DONALDSON: Dr. Stewart said something about a young man from the Kansas City Veterinary College being up for examination the fourth time. I think the fact is that every student who fell down in the preliminary examination also fell down on the other requirements. Nobody has been flunked in Minnesota for failure on

basic education alone. The scoring is very easy on copying and on spelling. I still stick to it that I think some of them must have slid through awfully easy. I had at one time a young man in the examination whose first excuse was that he could not take a written examination because he had forgotten his glasses and could not see to write. It was agreed that we would give him an oral examination and ask him the same questions. Well, we asked him the same questions as were on the paper. I strung him along until I asked him if there was any particular difference between the liver of a horse and that of an ox, and he said the gall bladder of a horse was a good deal larger than it was in an ox. In talking the matter over with Dr. Hay I said, "I cannot, for the life of me, see how that man escaped from college". Hay said, "I'll go you one stronger. I don't know how he managed to break in". I said, "I will try to find out", and I went and asked the gentleman just what kind of entrance examination he took. "Oh," he said, "I didn't even take that." "He said, "Why, I had a high school certificate". That is all there was of it—just what Dr. Hoskins said in his remarks.

I don't believe for a moment that any college can make a veterinarian out of every student. The man must have it in him to go after it himself, to make him a winner. If you are any judge of humanity at all you can see whether the possibility is there.

DR. W. E. STONE: I heartily agree with the gentleman who has just spoken. I remember distinctly one student with quite a little preliminary education and there were many boys in my class with no education, but were just as good students as he was and mastered the subject as well as he did and I believe much more easily. I remember last winter having a young man in my class who came into the college by examination but did not have the finances sufficient to buy himself any textbooks, and who had to work during the time that he possibly could spare from his classes, and who never took a note in one of my classes; and let me ask that man a question and it would come back to me just exactly as I put it out to him. That man occupied a back seat in the class room, and he would sit there with his head down and did not seem to be paying very much attention to what I was saying in my lectures; but when it came to quizz time he was there with the goods. That man, I learned, on inquiring into his early life, had been raised in an agricultural district and had a natural love for animals and was there in the school to make good; and I want to say to you gentlemen that he did make good in his work.

In drawing the line on entrance requirements in our veterinary schools it is certainly a very difficult problem to eliminate the unpromising material. If we were to take only high school graduates, we would take away the opportunity of many boys who have not been able to afford to go into the high schools, and yet many of whom will become our best practitioners. It would be placing it in the

hands of the more fortunate boys financially and otherwise. I have no remedy to offer to you gentlemen for this problem, but I believe it is the great problem that confronts the veterinary schools today.

Another thing to which I wish to refer is honesty in examinations in veterinary colleges. This is true not only in veterinary schools, but in other colleges as well. I remember when I was in veterinary college we used to call it rutting. I have been a student of a couple of the largest veterinary colleges in the country. I found in these two schools, and I might say in the school with which I am connected, a great amount of "ponying" which takes place in examinations where the students depend upon help other than what they have within themselves. In other words, the men in the faculties of our colleges are too lenient with those students and do not hold them to the line sufficiently. I think the schools are derelict in this line. I believe if the faculty would come right down and refuse to grade a paper where they have a suspicion of its not being original it would tend to help eliminate "ponying" out of our schools.

Again, I do not believe that the majority of our veterinary faculties grade in the subjects of spelling and writing when they are correcting examination papers. Dr. S. Stewart has referred to the fact that the rapid taking of notes had a tendency to overcome good spelling and writing. I heartily agree with him, because I know that oftentimes in writing examinations I would abbreviate my word or write it regardless of the correct way of spelling, just so that the instructor could make out what I meant. If I had been corrected and a demerit put after such a word, the next time I would not have done that. That may be due to the fact that our examinations are hurried, that we give too long examinations, that the time required to take them is not sufficient. If that be the fact, then it is up to the veterinary faculty to give examinations more in accord with the time available and give the student ample time to write out in full the answers he writes without using a single abbreviation in the spelling of a word.

There are a number of things I would like to speak of and another thing is reciprocity. I would hail the day with much delight when we could have a government board examination. All veterinarians would be glad of one universal board before which all veterinary students could go and take an examination and do away with the State boards entirely; or else have uniform State questions so that if a man is registered in the State of Missouri he could pass into the State of Minnesota and practice. If I am capable of practicing in the State of Missouri surely I am capable to practice in the State of Minnesota and I believe reciprocity is one of the great things. If it could be put into practice throughout this country it would be welcomed by all veterinarians and veterinary schools.

DR. HOSKINS: I feel I would be forgetful of what I believe personally today if I did not refer to Dr. Turner's paper and what

he said as emanating from our lamented Rush Shippen Huidekoper concerning some of the essentials of a thorough veterinary education. He had conceived the idea back in the early eighties that men who were going to enter the veterinary profession should have certain preliminary training or education and even then he hoped to live to see the day when there would be established a veterinary school at the University of Pennsylvania where the first year of every entering student would be devoted entirely to determining his aptitude for the profession. He considered, in the way of aptitude, that that student ought to know a great deal about animal life; he ought to know all about taking care of horses; and his thought was that he would put him into the stable and he would teach him how to use a fork for cleaning out the stall and teach him how to use the brush and curry comb and he would compel him to take a set of harness apart and put it together again and be prepared before going on with the more theoretical studies to know how to harness every kind of a horse and for every purpose and how to saddle a horse and how to ride one. After the expiration of that year, if he had shown that aptitude that he deemed necessary to fit him for the profession, he might then go into the other three years in order to obtain the technical education. We may still hope, or I sincerely do, that some such plan may yet emanate from some of our schools. For I consider it of far greater importance in qualifying a man to go out and perform the service he will be called upon for the people and for the State than a mere high school education.

I cannot help but take advantage of what has been said by Dr. Stewart and Dr. Stone on the subject of reciprocity. I have no doubt that neither of these men are aware of the fact that we have wrestled with that problem for twenty-four long years; but I am glad to see that we are getting nearer to the only possible solution of it under our form of government. We are getting to the time when we are going to ask and demand, as far as possible, of our federal government that she should raise continuously the standard for those who are going into federal service; and I am hopeful that she will establish very soon some standard of requirements for the veterinarians who are acting under the B. A. I., for the men who are going into the army, and into veterinary service, or any other position under our government. I am also hopeful—and I do not believe that it is a dream any longer—that when we are asked to give a certificate it will be a certificate based upon an examination and that examination planned by a committee of this association and when they give that certificate it will represent the standard of veterinary medicine in the United States and will tell every nation of the earth what our standard is. Then we may well go into the State legislatures and ask them to modify their laws and accept this certificate in lieu of an examination. Then we will see men rushing first to get this examination, and then we will see the schools preparing them-

selves to fit men to pass this examination. Then the man who has been ten or fifteen years out of school will have no fear that if ill health or some other misfortune comes ten or fifteen years after he has been in practice in a certain state and makes it desirable for him to go to another, that he may not be able to take some State examination, but will find that State has passed an amendment to its laws recognizing that the certificate he obtained when he was best able to obtain it entitles him to go into the State he desires without any of the barriers that exist today, and there practice and enjoy whatever features that State may offer to him, or which he seeks to enjoy.

PALPEBRAL MALLEINIZATION*

PROF. DOUVILLE, Veterinaire Aide-Major, mobilized with the armies

It will soon be two years since hostilities caused the mobilization of the equine effectives of France, and, as had been foreseen, their sanitary condition, although perfect at the beginning, was soon disturbed by the two diseases incident to all wars, glanders and mange.

Although the latter affection did not tend to spread until after the winter of 1914-15, glanders broke out in certain corps in October, 1914, transmitted to them perhaps by German horses which were abandoned, or captured in battle; or perhaps it resulted from the dissemination of latent infection in some of the requisitioned animals. The great problem of applying mallein to the contaminated effectives was considered and, to be frank, it was seen from the beginning that it could not be solved: insurmountable difficulties were encountered because of the conditions which must prevail for the proper execution of the subcutaneous mallein test.

The intradermal mallein test was to save the situation. The different duties which have been confided to us since the beginning of the war have permitted us to assist from the beginning with experiments on a very large scale to test it parallel with the subcutaneous method and, at the same time, to verify every positive result by autopsy.

Now that it has been tested for 15 months and has displaced the previously recognized test we have acceded to the request of

*Translation from *Recueil de Medecine Veterinaire*, V. 92, p. 257, May 15, 1916. By. M. Dorset.

the Editor of the *Recueil de Medecine Veterinaire* to describe it to his readers. We make absolutely no claim for original work: the technique, the judgment of the results, the classification of the subjects and the measures to be taken, are set forth in the Ministerial Circular of December 23, 1914, which only codifies the publications of MM. Drouin and Naudinat.

We review these, adding thereto a typical case, some details, certain personal observations, some exact experimental data which may guide or instruct colleagues who have little familiarity with this method, and which, finally, may convince the skeptics if they still exist.

The method of intradermal malleinization is merely a combination of the procedures employed by Prof. Lanfranchi¹ for glanders and by Prof. Moussu for tuberculosis.

Early in 1914, the former published the excellent results which he obtained in the diagnosis of glanders by the subcutaneous injection of the classical dose of diluted mallein at the border of the lower eye-lid.

Similarly, on the same date, M. Moussu, whose name will remain associated with the intradermal tuberculin test, recommended the injection of 0.1 cubic centimeter of diluted tuberculin, not into the sub-caudal fold but into the dermis of the lower lid. The results were distinct and much more striking than at the old point of election.

The extreme rarity of glanders in France at that time did not give to experimenters the opportunity to apply either one or the other of these methods.

Nevertheless the French veterinary missions in Greece (Military Mission: Veterinary Major Laumarque; Civil Mission: MM. Drouin and Naudinat) found a field for experimentation in the Grecian cavalry infected with glanders as a result of the Balkan war. The results of their experiments, which confirm those obtained by Professors Lanfranchi and Moussu, were published by MM. Drouin and Naudinat.²

The mobilization having placed us by the side of M. Laumarque, we are, in truth, compelled to say that he was the intro-

1—Lanfranchi—A new method for the diagnosis of glanders—Intrapalpebral Reaction to Mallein (*Il Moderno Zooiatro*, January 31, 1914), Review in *Recueil d'Alfort*.

2—Bulletin de la Societe Centrale de Medecine Veterinaire, Decembre, 30, 1914; *Revue Generale de Medecine Veterinaire*, Aout, 1914.

ducer of the intradermal test in France and in the Army. From October, 1914, he demonstrated the technique and the results upon the glandered horses of *C. A.*, of which principal Veterinarian Schelemeur had the veterinary control. With remarkable diligence M. Schelemeur applied the process to all his effectives and the epidemic was checked when the Ministerial Circular of December 23, 1914, appeared.

At the same time we applied the test systematically to the horses evacuated from the front to the depots for sick horses and an assignment to apply the palpebral mallein test in the latter, permitted us to apply it on a large scale and, accordingly, to judge of its value.

The staff of a quarantine hospital for suspected animals (groups C and B) permitted us to test it and to compare it with subcutaneous malleinization. We have taken care to autopsy all of the slaughtered subjects in order to determine in each case the nature and the extent of the lesions, and we do not hesitate to proclaim that our faith in the palpebral malleinization has only increased with added experience.

In July, 1915, we had the honor to be sent on a mission by the *G. Q. G.* to Brigadier General Moore, Director of the Veterinary Services of the British Army, for the purpose of having a conference with him and his veterinary officers and of making a practical demonstration of the palpebral method. The results were conclusive and upon our departure the Brigadier-General gave us the assurance that the procedure would be immediately applied in his services. This spirit of initiative and prompt decision are an honor to such a chief and it is one of the happy consequences of the autonomy of the British Veterinary Service.

TECHNIQUE.—1st. The necessary material comprises: a one cubic centimeter syringe with a set screw, graduated in tenths, and provided with fine and short needles (length: 10 to 15 millimeters); 2nd, mallein diluted to $\frac{1}{4}$ (crude mallein=1; 0.5% solution of phenol=3), as prescribed by MM. Drouin and Naudinat, is employed generally in the Army. The Pasteur Institute delivers it in tubes labeled specially "mallein $\frac{1}{4}$ for intradermal reaction". In default of this we have used mallein diluted to 1/10; the results are practically the same provided the dose is doubled so as to be $\frac{1}{5}$ of a cubic centimeter.

The application of the twitch to the upper lip or to the ear is

indispensable in order to operate quickly and conveniently; a staff of three assistants enables the somewhat experienced operator to apply the mallein to at least 100 horses an hour.

Either eye may be used for the injection. It is as easy on the right as on the left. Nevertheless it is contraindicated to operate upon lachrymating eyes or those affected with keratitis, acute conjunctivitis, or epiphora. On the contrary, old lesions (leucoma, cataract, dislocations of the crystalline lens) interfere in no way with the result. When operating upon a great number of horses it is prudent to note the side selected and, if there is occasion, the animals in which the opposite lid is selected and the reasons therefor. One thus avoids embarrassment the next day and faulty interpretations which may result therefrom.

The injection is made into the dermis of the lower lid about one centimeter from the free edge. Disinfection of the point of injection is not absolutely necessary; we practiced it at the beginning and little by little we dispensed with it without ever observing local infections. In the case of certain dirty or greasy lids, wiping with a cotton tampon wet with alcohol or ether is advantageous.

The dose to be injected is $1/10$ of a cubic centimeter. The syringe, filled, with needle attached and with set screw regulated to 0.1 cubic centimeter, is held in the right hand between the thumb and middle finger, while the index finger rests upon the milled head of the stem of the piston. The left thumb and index finger make a horizontal fold on the lower lid into which the needle is introduced for a distance of three millimeters, and as near as possible to the surface of the skin; "the injection should be made into the dermis." This requirement, which has disturbed numerous beginning operators and has caused the technique to be regarded as delicate, is by no means a *sine qua non*. MM. Drouin and Nau-dinat have obtained the same results by injection into the deep layers of the skin.

When the injection is well made it produces a small lenticular swelling; it seems to us that this is easier to obtain and to verify when instead of making a fold in the skin, the index finger is passed into the lower conjunctival cul-de-sac in such a way as to stretch the lid, the thumb immobilizing it and rendering it more easily perforated. However that may be, the technique remains extremely simple and available to every practitioner.

PHENOMENA FOLLOWING THE INJECTION: In the majority of horses, in the first hours following the injection, a circumscribed edema appears on the lower lid; it is of an irritative nature, non-toxic, only slightly painful and of quite short duration. When the mallein is applied in the morning it disappears during the night or it is found in the process of distinct retrogression the next day. No significance should be attached to it. It suffices to know of its existence or the possibility of it. In healthy animals the eye preserves its normal appearance. In glandered animals the reaction becomes defined about the 10th or 12th hours, attaining its maximum from the 24th to the 36th hour. It lasts two or three days on the average, subsides, and disappears without leaving any trace, except for a certain amount of local thickening of the connective tissue.

The typical reaction is distinctly striking.

A voluminous edema involves not alone the lower lid but also the tissues surrounding the eye, almost closing it and reducing the size of the palpebral opening. This edema is always hot, sometimes burning and extremely sensitive: the patient flinches at the slightest attempt to touch it.

The conjunctiva is markedly congested and from the internal angle of the eye there flows a muco-pus more or less abundant, which becomes transformed into a sulphur-colored exudate, at the border of the eyelashes.

There are occasions where the reaction seems to localize itself in the lower lid. The conjunctivitis and the exudate are as distinct as in the complete reaction, but the edema, although quite voluminous, is circumscribed in the angular space above the zygoma; of characteristic importance, and to which we attach great value, is the fact that this region exhibits to the touch the same characters as in the complete reaction (heat and marked hyperesthesia). The edema is as persistent as in the typical reaction; often it extends below the zygoma and is accompanied by fine sinuous lymphatic lines converging toward the sub-lingual glands. Palpation of the surface of the masseter is painful and the gland is sensitive.

Such a reaction, although exclusively of the lower lid, should cause the horse to be regarded as affected with glanders and we believe that it should be classed in the group of positive reactions. Its establishment is easy by comparison with the opposite eye; by taking care to administer the mallein in the morning and to make

the judgment of the test the afternoon of the next day, it cannot be missed.

In the bulletin of the Central Society of Veterinary Medicine (30th December, 1915) M. Fayet reported delayed reactions which appeared only toward the 3d, 4th and 5th days following the injection; he considered them as very rare and we freely agree with his opinion; among 12,000 mallein tests which we have applied ourselves, including 104 horses (affected with clinical or latent glanders) we have not been able to record a single one.

DOUBTFUL REACTIONS. By considering the edema of the lower lid, having the characters which we have described, as a positive reaction, the number of doubtful reactions and the size of group B of the Ministerial Instructions are considerably reduced³. Does that mean that they do not occur? No, but they are very rare.

Between the reaction previously described and the swelling without diagnostic value, which persists at times in some healthy animals, one may observe some intermediate grades with regard to which the operator must exercise his common sense and his clinical knowledge.

Conjunctivitis is generally absent or is very slight. The palpebral edema affects only the lower lid, it is diffuse, or at times is circumscribed about the point of injection in the form of a crescent with a tendency to extend over the zygoma.

In doubtful cases we test the other eye after 5 or 6 days, making the intradermal injection into both lids, the upper and lower.

We have stated that during the period of incubation of glanders the infected subject may present atypical reactions although it will react clearly some days later, its body having had time to become sensitized to the reacting toxin.

In addition, the examination and control of a lot of horses classed in group B, evacuated from the front, has shown us that as a result of the edema of the lower lid the connective tissue becomes thickened, the skin adherent, to a certain degree, to the zygoma and

3—TRANSLATOR'S NOTE. The author here refers to French Ministerial Instructions, dated December 23, 1914, in which the horses subjected to test are placed in three groups, as follows:

"Group A.—Subjects which either do not present any edema, or else only an insignificant reaction.

Group B.—Subjects in which the reaction affects only the lower lid and may be considered as doubtful.

Group C.—Subjects which present a typical reaction (edema of both lids, and a purulent conjunctivitis)."

for some time the region is unsuitable for good reactions. If one attempts a second test, the edema remains diffuse, the conjunctivitis is slight, and one is justified in having doubts as to their significance. These doubts have always been relieved by testing the upper lid simultaneously. In infected cases this becomes swollen, the supra-orbital fossa fills up, and there is a ptosis of the lid. We believe that it is advantageous to utilize this additional source of information for doubtful or suspected cases; personally it has given very much more satisfaction than the hypodermic control.

* * * * *

VALUE AND ADVANTAGES. With the object of determining the relative value of the two methods, we have submitted all of our horses successively to palpebral malleinization and to the subcutaneous test; each positive reaction has been checked by autopsy.

The first conclusion which forces itself upon one is that the glandered horse or the horse in the incubative stages of glanders, reacts marvelously to infinitely small doses of mallein. The toxin indicates the presence of lesions without relation to their location, their extent or their age. In horses with latent glanders the intensity of the reaction has not seemed to us to be always "in inverse ratio to their extent or their chronic character".

We have produced superb palpebral reactions as well in horses with two or three recent nodules as in animals whose pulmonary substance was filled with glanders nodules of the size of a hazel nut and whose tracheo-bronchial glands revealed numerous miliary abscesses. All of our clinical cases of glanders (40) have reacted to the intrapalpebral test, although five of them gave atypical subcutaneous reactions, insufficient in themselves to establish the diagnosis if that had not already been established by the clinical examination. It is possible that in rare cases of undoubted glanders the intradermal test has sometimes failed: the organism, saturated with toxin by the natural disease, remains insensitive to the introduction of a small supplementary dose of mallein. In such a case, where the palpebral method remains negative, one cannot expect anything from the classical procedure, but the clinical diagnosis is almost always forced upon the experienced practitioner. In the case of latent glanders, positive palpebral reactions have not always been confirmed by subcutaneous test, although we have taken all precautions to avoid chances of error.

In 120 eye reactions we have had 104 confirmations by the subcutaneous test.

In subjects with fever which have responded poorly to the classical procedure (old method), we have had no exceptions to the intradermal test.

Notwithstanding the increasing importance, which for ten years has been attached to the local reaction in the subcutaneous test, doubts have arisen in the minds of numerous observers when the tri-fold reaction was incomplete. We know, nevertheless, how uncertain the general organic reaction is, and what limited significance should be attributed to a rise in temperature. The intradermal method has considerably simplified the problem if it has not entirely solved it. Its superiority lies in basing the diagnosis exclusively upon the local reaction and in having this develop in striking form in a region where its presence can hardly be mistaken. With it, doubtful reactions are much less frequent.

All of our colleagues who have made numerous subcutaneous mallein tests have been able to establish that in certain horses mallein may cause a more or less considerable rise in temperature, attaining at times 40° C., oscillating for the most part about 39.5° C. for some hours. Notwithstanding the absence of local and general reactions, this rise of temperature is liable to influence some observers. All subjects with fever of this kind that we have tested by the intrapalpebral method have always given clearly negative reactions, and after some weeks of observation with repeated tests, we have not hesitated to sign their discharge. It is well to remember that this hyperthermia is generally provoked by affections quite distinct from glanders. Melanosis (Comeny, Nocard, Mauri) chronic broncho-pneumonia (Trasbot) pulmonary emphysema (Schindelka) strangles particularly (Cagny) are among the number. We consider that, from all points of view the intradermal mallein test constitutes a distinct improvement over the classical procedure. Its diagnostic value, although based exclusively upon the local reaction, is certainly equal to that of the test formerly used; personally, we have found it superior and when employed exclusively, with system and at the right time, it has always enabled us rapidly to eliminate infected animals.

From a practical point of view, its advantages are even more numerous and frequent. They are those which M. Moussu has pointed out for the palpebral tuberculinization: no necessity for taking temperatures; no chances of error through abortive temperature reactions or through erroneous reading of the thermometer; no

obligation to work at fixed hours; the veterinarian chooses the hour for injection and for the interpretation of the test; the possibility of immediate application to febrile animals; the possibility of making a great number of successive tests (several hundred a day) with economy of personnel, the possibility of application to all horses under all conditions of surroundings, of quarters (stable or bivouac) and of exterior temperature; the possibility of repeating the tests periodically; almost complete elimination of injuries to assistants from kicks, always to be feared with the classical method; economy of thermometers, of mallein and of time.

These multiple advantages have quickly appealed to our British allies. Our distinguished colleague, Prof. Hobday, commanding officer of a veterinary hospital, wrote us recently: "Since your conference thousands of horses have been tested by this method; as to the results and our opinion, I believe I am justified in saying that we all think that it is the most excellent and the most accurate.

"We employ it now as the regular method of testing and I am certain that the Brigadier-General Director of the Veterinary Service will send you a reply confirming all that I have written you." General Moore had in truth the kindness to advise us that "according to the reports of all his officers they had no objection to make".

Is not all of that sufficient to permit the statement that at the present time the intradermal malleinization is "the most simple, the most expeditious, the surest, and the most practical" in order to check glanders under all conditions?

TOLERANCE TO MALLEIN—ASSOCIATION OF THE TWO METHODS:—Our numerous mallein tests combined and reversed have permitted us to study under all conditions the question of tolerance to mallein.

Here are the different problems which we have considered and the solutions obtained:

1. Is there a tolerance to the palpebral mallein test? The horse infected by glanders reacts to the palpebral test as many times as one applies it, whatever be the period which elapses between the successive tests. Let us remember, however, that if one uses a lid which has been recently tested the second reaction may be diffuse and doubtful on account of the thickening of the connective tissue.

The intradermal reaction applied to the upper lids or to the shaved surface of the neck or shoulders has always confirmed the

reactions on the lower lid. They take place within the same time and are easily interpreted.

We have established many times that the weak dose of mallein used in the intradermal test is sufficient to produce an appreciable and lasting rise of temperature in horses with virulent lesions.

* * * * *

2. Does tolerance exist in the case of the subcutaneous test? Although it is prescribed and is the custom to allow an interval of three to four weeks between two mallein tests intended to check each other, we have reduced this time little by little to a ten-day and sometimes to an eight-day period. Our conclusions confirm those already expressed by Nocard, Drouin and Galtier: *there is no tolerance to mallein*. Two injections made several days apart give identical results. Before determining upon this reduction in the time between tests, and, we must admit, a little influenced by what we knew about tuberculin, we applied to glanders the method of the double dose recommended by Vallée for tuberculosis. Animals which we knew to be affected with latent glanders as a result of one palpebral and one original subcutaneous test, have reacted in the same time and in the same way with a double dose of mallein; the reaction was in no case earlier.

Tolerance to mallein does not exist. It therefore follows:

1. That a palpebral mallein test may be followed without delay by a subcutaneous injection.
2. That after a subcutaneous test, even though positive, the subject remains sensitive to the intradermal.

The facts which we record herewith are absolutely genuine and are in conformity with these conclusions. Among contaminated effectives in the case of doubtful or suspected subjects when one desires to repeat the palpebral tests or to associate the two tests with the object of control, it is indispensable to allow a lapse of time of at least 12 to 15 days between them. This delay corresponds to the period of incubation and to the sensitization of the subject to mallein. It is extremely probable that the supposed failures of the palpebral test, revealed by a subcutaneous test some days later, are due to failure to observe this delay.

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[The article by M. Douville has been translated in full, there being omitted merely a chart and table, together with the records of several illustrative cases.]

A PRELIMINARY REPORT ON THE INTRAPALPEBRAL MALLEIN TEST*

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In recent veterinary literature the intradermal palpebral or intrapalpebral mallein test has occasionally been mentioned as useful in the diagnosis of glanders.

This method seems to have been first reported in 1914 by Lanfranchi in Italy.* The French Commission in Greece under Drouin carried on extensive experiments with this method.** Finally in France after the preparation of intradermal mallein was modified, the method was considered as second only to the subcutaneous test.

Captain Goodall in Africa found the intrapalpebral test a valuable method for the diagnosis of glanders under severe campaign difficulties.*** Some cases of glanders gave no reactions and some doubtful reactions to the subcutaneous test. These cases gave positive reactions to the intrapalpebral method. M'Fadyean reports on the value of the palpebral method on two million cases, after it was adopted by the British Army. He considers this method at the present time, superior to any other.* Captain Holmes found this method to be very valuable in his experiments.*

In a preliminary note upon the intradermal palpebral test, the *Veterinary Journal* for August, 1915, states that this method never failed in 5-6000 tests. In almost every instance the palpebral and subcutaneous methods agreed. However, in a few cases of glanders, the palpebral method gave positive reactions while the subcutaneous test was indecisive.

Having had an opportunity to observe the veterinarians of the French Army apply this test to horses purchased in this country and having had an exceptional opportunity to give this method a trial on horses presented to be slaughtered for food purposes, I note my observations and findings.

This method has been applied to over 500 healthy and 27 glandered horses. The complement fixation, agglutination and ophthal-

*Vet. Journal, 1915-1917.

**Amer. Vet. Rev., 1914.

***Jour. Comp. Path. & Ther., 1916.

*Prepared for the New York State Veterinary Medical Society meeting at Ithaca, N. Y., July, 1918.

mic mallein test were also applied as a routine procedure. The subcutaneous method was applied in a number of instances. Careful and detailed post mortem examinations were performed on the non-reacting as well as the reacting animals. Laboratory diagnosis was frequently made of typical as well as questionable material. Only that data is considered where there remains no question as to the facts of the case.

There were some doubtful reactions to the palpebral test among the healthy horses. In most of these cases the other tests were either negative or suspicious. On post mortem examination if there were any lesions, they were found not to be glanders.

Of 24 cases of glanders considered with the one exception noted later in the paper, 23 gave positive intrapalpebral local reactions. One case noted in the paragraph on temperatures gave a typical thermic reaction but not a satisfactory local reaction.

MALLEIN. The mallein employed was the same as that prepared for the veterinarians of the French Army, according to their directions. One volume of ophthalmic mallein diluted to three volumes of a 0.5 per cent carbolic acid solution. The dosage used was 2 minims or 1/10 c.c.

TECHNIC. A metal hypodermic syringe with a glass barrel of 1 c.c. capacity, fitted with a stop on the piston rod and graduated in tenths of a c.c. was found most convenient in performing the test. A fine bore needle of steel, 5/8 of an inch in length and strengthened by being soldered in deeply at the cup, was found to be the most desirable.

The test may be applied to either eye. The lower eyelid was the usual site of injection, though some have applied the test to the upper eyelid.

In most cases the holding of the horse's head by an assistant is sufficient means of restraint; however, in restless animals a twitch may be applied.

A fold of thin skin of the lower lid of the eye is grasped by the fore finger and the thumb as near to the margin as possible. The needle is inserted into the dermis, parallel to the margin of the eyelid and midway between the inner and outer canthus. The syringe is inserted into the head of the needle and 1/10 c.c. of mallein injected.

A little practice soon develops the necessary skill in the technic of the operation. The possibility of injecting the mallein under the

skin, while likely to obscure and delay the reaction, does not materially interfere with the test. In such instances the temperatures assist in the interpretation, and limit the danger of error. With ordinary precautions of cleanliness and antisepsis no danger of injury or infection is likely to occur.

The intrapalpebral mallein test produces a thermal and a local reaction, and occasionally a general reaction.

LOCAL REACTION. The positive local reaction is obviously the most striking and important. In glandered animals it commences a few hours after injection. Sometimes an inflammation is observed as early as the second or third hour. The height of the local inflammation is reached at different times in the course of the reaction. At times it is most marked at the eighth to the tenth hour after injection, at other times it may be most marked as late as the forty-eighth to the fifty-sixth hour. The reaction has been observed to last seven days after injection, but usually evidence of the reaction may be noticed up to the fourth or fifth day.

A positive reaction comprises a hot painful diffuse swelling of the lower lid and may involve a considerable area about the eye. The conjunctival mucous membrane is usually congested and a purulent conjunctivitis occurs as a rule, with a dirty purulent or muco-purulent discharge from the inner canthus. The free edge of the eyelid is swollen and tends to protrude upward at the inner canthus. The inflammation often extends to the upper lids, sometimes it extends as far as the zygomatic ridge appearing to involve the whole side of that portion of the face. The eye seems to be sunk deep in the orbit due to the swelling which tends to make its fellow appear much smaller. Occasionally, corded lymphatics may be noted radiating from the local swelling. The untested eye at times may show some discharge at the height of the reaction. The corresponding submaxillary lymph gland is usually swollen and painful on palpation.

The local reaction in cases of glanders may vary in extent, intensity and degree. The inflammation may be so severe and extensive as to involve the side of the face completely closing the eye and producing a copious purulent discharge. On the other hand the inflammation may be but slight and affect just the area about the point of injection, and in some cases the discharge may be barely noticeable or entirely absent.

In animals not infected with glanders an inflammatory edema appears at the point of injection, which reaches its height at the eighth to the tenth hour and then subsides. This edema seldom persists for more than 24 to 36 hours. This swelling is not painful or diffuse and takes on a crescentric shape. Frequently a slight mucous or serous discharge, different in character from a reactor's dis-



FIG. 1. Positive reaction at 20th hour.

charge is also present. The conjunctival mucous membrane is not injected or congested.

This non-specific swelling is easily recognized if present at the time of reading the test. In the majority of cases there is practically no obvious change at the point of injection.

TEMPERATURE. In positive cases the temperature has been observed to rise as high as 105.7° F. and usually takes on a definite curve. The temperature may rise as early as the sixth hour after injection and, as a rule, follows the appearance of the local reaction. The height of curve seems to be reached from the 12th to the 18th hour. A fever temperature is frequently observed as late as the



FIG. 2. Positive reaction at 20th hour. Note corded lymphatics.

24th to 36th hour and sometimes even later. In some cases where the local reactions were marked and continued, the high temperature lasted as long as the third day. The temperature curve has occasionally been observed to make a sharp drop after it has remained high for a period. A rise would follow for a short time, then there would be a gradual drop to normal. In some positive cases a very slight rise in temperature was noticed, but in these cases the read-

ings were not taken frequently enough or at the most desirable times.*

In one case of glanders a typical temperature curve was observed while the local reaction would have been over-looked. In this case at the 14th hour when the temperature was over 105° F., the swelling and discharge were marked. In fact a slight purulent



FIG. 3. Positive reaction on 3rd day.

discharge was also present from the untested eye. The local reaction of the retest was not entirely satisfactory while a subcutaneous test gave a typical positive reaction.

Non-glandered horses usually show no rise in temperature after injection with intradermal mallein. There has been a slight tem-

*NOTE.—It was impossible to obtain the temperature of all cases for the full period of the test. Accordingly my observations are based on those temperature readings which I was able to make as complete as possible.

perature rise in a few instances of doubtful local reactions which showed no lesions of glanders on post mortem examination. Retests on these animals gave negative local and thermal reaction. The possibility of these horses having been tested before is likely and the temperature rises being the result of sensitization.

Most of the writers on this method of malleinization have given the temperature readings secondary or no consideration in the in-



FIG. 4. Positive reaction on 4th day.

terpretation of the result. Undoubtedly the greater majority of cases of glanders may be recognized by the local reaction alone. However, careful and repeated temperature readings will unquestionably decide doubtful reactions and, perhaps, occasionally point to the necessity of repeating the tests on certain animals.

GENERAL REACTION. The general reaction is not very marked

and, as a rule, not observed at all. Dullness and loss of appetite have been noticed and seem to depend upon the intensity of the local and thermal reactions. Lack of condition and loss of weight as result of the test have occurred in a few instances.

INTERPRETATION. The reaction is as a rule definite and characteristic. The diagnosis may be made upon observing the local reaction 24 to 36 hours after the injection of mallein. Doubtful reactors must be carefully observed for at least 48 hours. Taking a few temperatures between the 12th and 36th hours will often eliminate any indecision and occasionally help detect a case of glanders. Repeating the test to the other eye may settle any questionable reactions. To detect glanders it has often been necessary to apply more than one test or one method. To effectively control or eradicate this disease, matters of convenience and facility must at times be sacrificed.

EFFECT ON OTHER TESTS. The intrapalpebral mallein test has a transient effect on the serological tests after 24 to 36 hours. When applied shortly after the ophthalmic test it frequently brings out a reaction more prominently. Sensitization must be considered when repeated tests are applied. Otherwise the intrapalpebral method applied subsequently or in conjunction with the other mallein tests cannot be said to have any action of interference.

COMPARISON WITH OTHER TESTS. The intrapalpebral method being a clinical test, cannot be very well compared with the serological methods for diagnosing glanders. However, it may be said that the many inconveniences and occasional indecisive and unsatisfactory results of the latter tests have caused the veterinarian in the field to depend more upon clinical methods.

The single application of the ophthalmic test has proved rather unsatisfactory. In order to condemn a horse for glanders on the result of this test a distinct purulent conjunctivitis should be present. A copious discharge of pus, deep reddening of the mucous membrane, a swelling of the eyelids, and a rise in temperature if taken at the proper time, are the usual symptoms of a decisive reaction. The *suspicious* reaction with either a congestion, sero mucous discharge or perhaps purulent flakes occur too frequently. In performing the ophthalmic test, repeated examinations over a longer period of time as well as the taking of a few temperatures would undoubtedly uncover more cases of glanders and lessen the convenience attributed to this method of testing.

Mallein from different sources was used on 27 cases of glanders. Nineteen gave positive reactions to the ophthalmic test, seven of these had to be retested to obtain a positive result. The remaining eight cases were suspicious, four remained suspicious when retested. (All reacted to the palpebral method.) Among the many healthy horses tested too large a percentage gave suspicious reactions. A false positive occurred very rarely.

The accuracy of the palpebral and subcutaneous methods for the diagnosis of glanders compare very favorably when performed carefully by experienced operators. There is a disadvantage and a danger in the use of the subcutaneous method by the inexperienced in testing healthy horses. The false positives and atypical reactions are too numerous and confusing and are likely to be misinterpreted.

CONCLUSIONS. The intradermo-palpebral test is comparatively a simple, accurate, convenient, and reliable method for detecting glanders in horses. It is the most suitable method of testing with mallein in war times or when large numbers of animals must be speedily tested. If the local reaction alone is considered a large number of horses may be examined in a short period of time.

ADVANTAGES OF THE PALPEBRAL METHOD. 1. Simple in application.

2. Convenient in arrangement of time, especially if local reaction alone is considered.

3. Positive reactions are definite and doubtful or indecisive reaction not very frequent.

4. Reaction continues as a rule for forty-eight to seventy-two hours.

5. The reaction cannot be removed or modified.

6. May bring out a latent ophthalmic test.

7. Does not interfere with subsequent or other clinical tests.

8. The local condition of the conjunctival mucous membranes or a high temperature do not necessarily interfere with this method of testing.

9. Less mallein is used than in any other mallein test.

DISADVANTAGES. 1. Affects the serological tests.

2. Requires the use of a hypodermic syringe and needle.

3. The question of skill and care in the performance of this test may also be noted. However, the other methods also require this consideration if successful results are desired.

Interpretation of the reaction of various methods have much to

do with the value of the tests. Not giving thorough unbiased and careful trials have caused unfair condemnation of many different methods.

In conclusion I wish to say, if the opportunity continues, more detailed work will be done with the intrapalpebral method. An effort will be made to make a more complete comparison of the methods more commonly used before estimating its value. It is hoped that this method will be tried by others to establish its real worth.

VETERINARY DISEASES IN SOUTHERN RHODESIA*

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The *routine work* of the laboratory has considerably increased during the past year, and in the absence of the laboratory assistant on war leave most of the technical work has fallen upon the bacteriologist himself, the lay members of the staff having rendered any assistance within their power. The work has included the examination of over two thousand five hundred smears and specimens from the "field" and almost as many from animals under experiment at the laboratory. Of the former, one hundred and twenty smears have revealed the parasites of African coast fever, one hundred and twenty-five the parasites of other diseases, and thirty-three specimens of serum have indicated the presence of contagious abortion in cattle. It may be pointed out that each specimen has to be examined with the greatest care and that it is not those preparations in which the causal organisms of diseases are readily found which occasion the greatest labor and anxiety, but those in which after prolonged search no parasites can be detected, because failure to find them if present, may lead to a faulty diagnosis misleading to the veterinary officials responsible for the administrative side of the work. Moreover, smears are frequently forwarded carelessly taken and without the necessary clinical details upon which to base a microscopic examination. The importance of careful and accurate laboratory diagnosis in assisting the administrative side of the veterinary department has been emphasized during the past year on many occasions.

*Report of the Government Veterinary Bacteriologist, Southern Rhodesia, for the year 1916.

EXPERIMENTAL RESEARCH WORK has been considerably handicapped by the demands of the routine and technical work, and it has been impossible to devote to it the undivided and concentrated attention it deserves. Thus much of the research which has been attempted has had to be abandoned. Nevertheless, it is felt that in spite of these difficulties considerable progress has been made in the solution of some of the chief problems which handicap the pastoral industry of the country. For reasons of economy full details of the experiments carried out cannot be published, and only the results attained can be referred to in this report.

HORSE-SICKNESS. In the report from this division for 1915 it was stated that in the absence of suitable animals for experiments in connection with this disease, the Commandant General had placed at our disposal, on generous terms, horses recently imported as remounts for the police. At that time eighteen horses had been thus supplied. The system was continued during the present year and the results obtained were considered so satisfactory that it was decided to apply the process to horses already on the strength. Batches of six or eight animals were at first sent to the laboratory for inoculation, but later large numbers were stabled at the Police Headquarters Depot, Salisbury, and were treated there under a Farrier Sergeant Major and staff. In this way one hundred and fifty-six police horses were inoculated, with a loss of twenty animals. As these have been collected from all parts of the country and have been inoculated without regard for their age or condition it is felt that the death rate of 12.82 per cent is not excessive. The average age of those animals which have died, as shown by the police records, is eight years and nine months, but as aged horses when purchased are recorded as eight years old, the average is probably somewhat greater. The immunity of these horses when distributed and exposed to natural infection remains to be seen. Experiments have been conducted to determine the degree of immunity conveyed by this method. Three horses were taken, two previously inoculated and one as a control not previously treated; into each of them was introduced a quantity of virus taken from an animal which had died as the result of inoculation by Theiler's method. The control horse died on the sixth day while the two vaccinated animals remained unaffected. Again, police horse No. 092, inoculated in October, 1915, was brought in from Makwiro District during September and was given a quantity of the same deadly virus; no reaction followed.

Mules inoculated by Theiler's method have proved resistant to horse-sickness in most districts of Southern Rhodesia, and it is hoped that since vaccinated horses resist the virus used in protecting the mules, that they will enjoy a similar degree of immunity. Nevertheless, it is known that one virus differs from another and that the immunity against one may not necessarily hold good against infection from another, and thus it is anticipated that when inoculated police horses are distributed throughout the country many of them may become infected with a strain of virus peculiar to the district to which they are sent. This has been known to happen but past experience has shown that if this reinfection is detected and the animal is put by during the reaction its chance of recovery is considerably greater than that of an animal not previously treated. Thus the market value of an inoculated horse is increased and its usefulness for police purposes is considerably enhanced. During the year 1912-1913, of two hundred and seven police horses forty-five died of horse-sickness and in 1914-1915, of one hundred and ninety-three animals, forty-one died of the disease; as the present season bids fair to be exceptionally severe owing to the early and continuous rains, it is satisfactory to know that as many as one hundred and thirty horses are thus to a large extent protected against infection. It should be recognized that the inoculation of police horses in the first place was only undertaken with the object of carrying on certain experiments, and that the application of the process on a large scale was decided upon because of the excessive annual losses of police horses, which justified the operation so long as the inoculation death rate could be kept below a certain figure. The method, however, is by no means perfected, and much experimental work is still required to place the process upon a strictly scientific basis. Until the causal organism of horse-sickness has been identified and the many problems associated with it solved by careful research, any method of immunizing against it must rest upon a more or less empiric basis.

THE PLASMOSES OF CATTLE. The more general application of the principle of "short-interval dipping" has to a large extent reduced the losses due to these diseases, and at the present time there are farms to which cattle imported for the improvement of local herds can be introduced with safety without inoculation, and upon which the improved progeny grow up free from the tick-borne diseases. Although the advantages thus derived are great, it must be

remembered that the dipped areas in the country are far exceeded by those where the principle is not carried out and ticks and the diseases transmitted by them are prevalent. Thus in practice there would appear to be three stages in the development of a herd: the first or pioneer stage, when imported animals cannot be used for the improvement of the nucleus of native cattle unless inoculated, and when a heavy mortality of young stock must be expected from red-water and allied diseases; a second stage when by systematic dipping the veld becomes tick-free and imported stock can be introduced with impunity and the young progeny grow up and thrive free from disease; and lastly the stage when the animals bred upon such areas, being susceptible to tick-borne diseases, cannot be exposed to tick-infested veld, so that the market for them becomes restricted. Therefore, in spite of the progress and advantages of systematic dipping there are certain disadvantages associated with it until the system becomes universally practiced. In the meantime there remains the necessity for a satisfactory method of inoculation for the protection of imported bulls exposed on infected veld, and of young stock born upon tick-free farms, in order that they may be disposed of with safety beyond the limit of such areas. During the past ten years efforts have been made to discover a satisfactory means of conveying immunity, but experiments have unfortunately been handicapped by the extreme cost of experimental animals which have of necessity to be imported from countries free from these diseases; but from time to time consignments of cattle have been imported by progressive breeders anxious to improve the class of cattle in this country and the veterinary department has been called upon to inoculate them to the best of its ability. Thus in 1911 ninety-four bulls were imported and were inoculated with a loss of 5 per cent only, but many of these were inoculated with a virus supplied from the south and did not prove immune when exposed to natural conditions. Others, inoculated with a local strain of virus, suffered more severely at the time of treatment, but subsequently proved immune. The utility of such animals is somewhat impaired during their first year in the country, but a record of many of them is available and shows that some of them have taken honors in the show ring, notably the bulls "Baronet" and "Aerial Knight", and a considerable number have been responsible for as many as two to three hundred progeny, of improved type and bearing the impression of the sire. Again, in 1912, about

sixty-eight animals were imported from overseas, twenty-five home-bred animals died, but it should be pointed out that their owners had been previously warned that such stock was unsuitable for inoculation on account of age, soft condition, pregnancy, or in-breeding, and the inoculation was undertaken under protest. Nevertheless, in spite of the heavy mortality the survivors have proved a profitable investment, more than paying for the losses, the progeny of some of the inoculated females having been sold for three figures. In 1913 ninety-four cattle from Great Britain were inoculated with a loss of twenty-seven; this mortality which took place during the absence of the bacteriologist was probably due to some unaccountable exaltation in the strength of the virus used, and it was thought wise to suspend further inoculations until the process could be placed upon a safer basis. Since then no privately owned imported stock has been accepted for inoculation until October last, when eleven animals were received for treatment at the laboratory, the inoculation of which is not yet completed. During the interval, however, two small consignments of young cattle from England have been imported for experimental purposes and different strains of virus have been tested with the result that it is now hoped that, given suitable animals and proper accommodation, the principle can again be applied upon a large scale. It has been abundantly proved that to obtain the best results, animals submitted for treatment should not be too fat or pampered, or too highly bred, and should not exceed fifteen months of age. The mortality among such animals should be insignificant and recovery from the slight set-back caused by the operation should be rapid. Now that Rhodesia has, with her limited supply of high-grade animals, entered the meat markets of the world, no time should be lost in bringing up the bulk of her stock to the same standard of excellence as that exhibited by the sample consignments.

TRYPANOSOMIASIS. In January it was reported to the veterinary department that a large number of pigs were dying from some unknown disease at two farms on the northern border of the Umfuli River. In one herd of one hundred and fifty as many as twenty pigs had died, and a large number at the time were showing symptoms of the disease, and in the second herd of about fifty pigs five had died and many others were severely sick. Examination of smears submitted from sick animals revealed large numbers of trypanosomes of pecorum group, but differing slightly morphologically from the

trypanosome commonly met with in cattle in the Hartley District, notably in the fact that the body appeared more flexible and the undulating membrane more highly festooned, so that in fair specimens it was afterwards possible to distinguish the two by microscopic examination. One particular feature of interest in connection with the outbreak was that although the Hartley District has been known since the early days to be an area infested by *Glossina morsitans*, no tsetse fly had ever been encountered in the particular position where this outbreak was occurring and there was every reason to fear that the disease might be transmitted by biting flies other than the tsetse, or by some other means. Such a possibility was alarming, since the experience and research of the past ten years has led to the conclusion that as far as the trypanosomiasis of animals in Southern Rhodesia is concerned, it is seldom if ever transmitted from sick to healthy in the absence of the tsetse fly. That certain forms of trypanosomiasis can be so spread is admitted, and examples have been met with in neighboring territories; but it would appear that in such instances certain conditions are necessary, which may almost be laid down as axiomatic, namely, an original source of infection, generally an animal infected by the tsetse fly; an abundance of trypanosomes in the peripheral blood of the animal; very close contact between sick and susceptible animals; a vast number of transmitting agents, and finally certain climatic conditions of warmth and humidity. These essential conditions are seldom if ever met with in Southern Rhodesia. In order to study this disease of pigs one or two infected animals were sent to the Laboratory. With the virus thus supplied experiments were undertaken to ascertain the nature of the parasite and its infectivity to domestic stock, its transmissibility other than by the bite of the tsetse fly, and to obtain as quickly as possible a means of treating and preventing the disease caused by it. It was found that this disease could easily be transmitted from pig to pig by artificial inoculation of small quantities of blood, giving rise to a disease rapidly fatal, killing untreated animals in less than thirty days. Small laboratory animals did not become infected even by repeated doses of virus from a natural case, and sheep and cattle exhibited a marked degree of resistance. Transmission experiments undertaken proved negative and a natural experiment showed that infection from sick to healthy was not readily effected by biting flies. At the laboratory sick and healthy were closely styed together and were continually pestered by swarms of stomoxys which were

noticed to pass from one to the other. Nevertheless no infection of the healthy took place except by means of the syringe. Thus the manner in which so gross an infection can have been brought about under natural conditions remains to be shown. The problem of greatest importance to be solved was to find a means of protection and treatment. For several years the trypanosomiasis of Hartley cattle had been found to yield to massive doses of antimony and arsenic. But the former drug had to be carefully injected into the vein, because if it made its way under the skin it gave rise to severe abscesses and sloughs; it could not therefore be applied in the same way to pigs, and further, its beneficial effect upon bovine animals was largely due to their peculiar tolerance to antimony. It was necessary therefore to discover a form of the drug which could be administered to pigs without harmful effects and this was finally met with in a combination of emetic and arrhenal which was applied with most favorable results; but it has to be admitted that in the great majority of cases a complete cure was not effected but merely, as in cattle, a state of tolerance established, enabling treated animals to live in apparent health until adverse conditions reduced their resistance and once again the trypanosome reasserted itself and produced its harmful effects. Thus in one herd the results were most favorable and the disease was arrested so that the great majority of animals could be fattened off and disposed of, but in the second herd, where the owner failed to supply an adequate diet, the good results of the treatment were but temporary and most of the animals died. During the year a few experiments have been conducted in connection with other forms of trypanosomiasis; the appearance of *T. bruci* var *rhodesiense* in donkeys working at the junction of the Umfuli and Umnyati Rivers indicates that the distribution of this form of infection is greater than was supposed, and in view of the possible transmission of the parasite to man by *G. morsitans* and the invariably fatal disease set up, experiments were conducted with remedies for which success has been claimed by workers in European laboratories. The most important of these was that recommended by Daniels and Newnham in the *Lancet*, January 8th, 1916, page 102, who claim to have permanently cured a case of human infection with *T. rhodesiense* by subcutaneous injections of 30 minims of Martindale's solution (injectio antimoni oxidi) given subcutaneously twice a day. This drug, when applied to pigs infected with the small trypanosome of pecorum group, in the dose recommended, produced no apprecia-

ble effect. Martindale's solution is supposed to contain one hundredth of a grain of antimonious oxide in 1 c.c. of glycerine and water equal parts. Nevertheless infected pigs and sheep received quantities containing as much as 0.5 gm of antimonious oxide without harmful effect, but without beneficial results or apparent influence upon the course of the disease. An ox naturally infected received up to 2 gm of the salt in suspension but the parasites did not disappear from its blood and the animal died from trypanosomiasis six days after the last injection. The results with this agent were very disappointing, as difficulty was being experienced by the military authorities in passing animals through the fly-belts of Northern Rhodesia on their way to the northern frontier of operation, mules becoming infected and useless for transport work and fly-struck cattle proving unsuitable for human consumption. The use of tartar emetic, although beneficial, had its disadvantages owing to the difficulty in application and dangers of local injury, and it was hoped that if the tri-oxide of antimony was equally effective and could be applied subcutaneously in the form of a cream, it might take its place with advantage. Unfortunately experiments showed that the results obtained were by no means as good as those following the use of emetic, and the treatment could not be applied in practice.

DIPPING OF SHEEP. Reference may be made to an experiment carried out at the request of the Chief Veterinary Surgeon to ascertain the effects of "short-interval dipping" upon sheep and lambs. A small flock made up of thirty-nine sheep and lambs of mixed breeds, the majority being half-bred Persians, but six of long-wooled varieties, were purchased for the purpose. All these animals were in a most emaciated condition and suffering from fluke, wireworm, tape-worm and the nodular-worm of the intestines. It was with difficulty that they were driven from the farm from which they were purchased, to the laboratory. On the 5th of February dipping was commenced in Cooper's dip, one in three hundred strength, in which they were immersed three times in ten days; the strength of the dip then being increased to one in two hundred and fifty. Dipping was carried on regularly twice a week in this strength until the 16th of April, making nineteen dippings in all. During this period ten animals died, namely, four sheep (one woolled) and six lambs, these being the weakest of the flock. The rest of the flock improved markedly in health. The experiment was then discontinued but the result is still apparent in that the survivors are still alive and in the best of

condition, and the ewes have given birth to lambs which have thrived and grown out in spite of the fact that most of them have been born during the dry season. The experiment was originally intended to determine to what extent small stock could be dipped with safety in areas which have to be freed from African coast fever. It is probable that such drastic measures could not be applied in a damp atmosphere, or to woolled varieties because of the damage to the fleece, but in practice this would not be necessary. The experiment, however, has gone further in affording support to the observation of officers in the field that dipping exerts a beneficial action upon sheep infected with worms. The results have been so remarkable that when opportunity arises further experiments of a more exact nature will be carried out.

CONTAGIOUS ABORTION. This disease has been detected by means of the agglutination test in several new centers during the year, and owing to the local peculiarities presented by it has caused some uncertainty as to the best means of dealing with it. The application of the pipette method of collecting blood has proved of great value in allowing specimens to be taken by laymen, which in the great majority of cases have arrived at the laboratory in a suitable condition for the test. In addition to quarantine, isolation, and the removal of the bull from the herd, vaccination has been practiced in several instances. The results reported by officers in charge of the outbreaks have on the whole been favorable, but whether these can be attributed to the vaccination or to the other measures adopted cannot be definitely stated. As the result of an investigation into the outbreak of this disease in the Marandellas District, D.V.S. Johnston reports upon the use of vaccine as follows: " * * * it will be noticed that on those farms where the cattle were treated with vaccine there have been no cases of abortion, whereas, on Mr. Bradshaw's farm, where only antiseptics were used, the abortion broke out again after a lapse of several months" * * * " * * * on Nua farm the cows aborted after being treated with corrosive sublimate solution, but after the vaccine treatment there have been no cases—unless the calf which was born and was never found, was a case." At a recent meeting of the Umvukwe Ranches Association the vaccine treatment was favorably referred to. As the result of experiments conducted by the Board of Agriculture in England, the protective inoculation of cattle against contagious abortion has proved successful when the vaccine has con-

sisted of "massive" doses of living organisms, but equally good results have not been obtained when vaccines have been killed by heat. On the other hand, a certain firm of repute continues to issue a dead vaccine and claims good results from it. Although agglutinins are not identical with immunity they do to a great extent run parallel with it, and may be accepted as an index of the production of immune bodies in an organism. Experiments were conducted to test the relative value of (a) living vaccine, (b) carbolised vaccine and (c) vaccine killed by heat, from which it was found that a vaccine of *B. abortus* killed by extreme heat gave rise to a reaction almost as great as that produced by a living vaccine, but of a somewhat shorter duration. It would be unsafe to issue a living vaccine in this country where transport facilities are often primitive and where it is often impossible to determine whether an animal is pregnant or not; but since a small dose of vaccine killed by heat does cause a marked reaction it is probable that frequent injections of massive doses would prove efficacious. Unfortunately the number of veterinary officers to perform the operation in the "field" is limited and the maximum capacity for cultivation of the organism in this laboratory is at present about one hundred and fifty massive doses per mensem.

VARIOUS. A number of experiments have been conducted with material suspected to be poisonous, some supplied by the agricultural chemist for test upon laboratory animals and others sent in from the field. An outbreak of disease at Rusimbas Kraal, Chibi District, was at first suspected to be due to African coast fever, but when this diagnosis could not be supported by the microscopic examination of preparations, certain poisonous plants were suspected. One of these, a kaffir onion known as "Chitupatupa", used by natives for poisoning pools when catching fish, was incriminated, but large quantities did not set up any poisonous symptoms in test cattle. Similarly the root of a bush known as "mutsuri", used by the natives for the same purpose, proved harmless in comparatively large doses. An interesting case of tuberculosis was detected in a nine-year-old cow in a herd in the Umtali District; the mother of the animal died of the disease in 1913 and the grand-dam in 1911, both of them presenting lesions which in all probability were those of tuberculosis. The herd was tested with tuberculin and several animals were found to be tuberculous.

ACCOMMODATION. The inadequacy of the existing accommoda-

tion was pointed out in the annual reports of this division for the years 1913, 1914 and 1915, but has not yet been improved.

EXPENDITURE. Details of expenditure are given and show that exclusive of salaries, the work of the laboratory has been maintained at a cost of a little over \$1500, and has been undertaken by the bacteriologist with the assistance of a lady clerk and a stockman.

TWO NEW FLUKES FROM THE DOG*

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So far as we are aware, the only fluke reported from the dog in the United States is *Paragonimus kellicotti*. This fluke occurs in the lungs of dogs, cats and swine. Ward and Hirsch (1915) note that the worm was discovered in the lung of a dog from Ohio by Kellicott. They also note, regarding lung fluke: "Null stated casually that it occurs in dogs and cats from the Oriental quarters of San Francisco, but gave no further data regarding the parasites."

In a series of 300 dogs examined post mortem here at Detroit, we have found intestinal flukes in 7 animals (Nos. 122, 133, 134, 195, 229, 237 and 281). The flukes of these dogs belong to 2 different species. The 2 species of flukes appear to be undescribed, and we have accordingly created new species for them.

An examination of our flukes shows that they belong in the genus *Hemistomum*, but an examination of the status of this generic name, which is the one in common use, indicates that the name is not in good standing, and while we are reluctant to tamper with nomenclature, a proceeding which always invites criticism from some school of zoologists, we are even more reluctant to refer new species to genera which are without standing. According to Stiles and Hassall (1908), *Hemistomum* Diesing, 1850, has as its type species, by inclusion and by the first species rule, *H. alatum* (Goeze, 1782) Diesing, 1850. But Railliet (1896) has renamed *Hemistomum* Diesing, 1850 (not Swainson), proposing the name *Conchoso-*
mum Railliet, 1896, with *C. alatum* as type species. However, a

*Read before the Zoology Section of the Michigan Academy of Science, March 29, 1918.

further examination of the extremely useful bulletin by Stiles and Hassall (1908) shows that the genus *Alaria* Schrank, 1788, has as its type, and only, species *A. vulpis*, which is a renaming of *Planaria alata* Goeze, 1782, the fluke which has been called *Hemistomum alatum* since the publication of that name by Diesing, 1850. In default of any earlier nomenclature affecting the status of the generic name *Alaria* Schrank, 1788, or the specific name *alata* of Goeze, 1782, it appears that the fluke from dogs and other carnivores in Europe should be known by the name *Alaria alata* (Goeze, 1782) Hall and Wigdor, 1918. This fluke has been assigned to the family Holostomidae E. Blanchard, 1847, and to the subfamily Hemistominae Brandes, 1890 (name used by Brandes on Plate 40 and overlooked by Stiles and Hassall, who credit this name to Braun, 1893), and the tribe Hemistomeae Brandes, 1890. Since the name of the genus on which the subfamily and tribe names are formed must be changed from *Hemistomum* to *Alaria*, the subfamily and tribe names must be changed to Alariinae and Alarieae.

These flukes belong to the Holostomata, or metastatic trematodes, those which develop without intermediate generations arising by asexual methods. Two larval forms develop and pass through an intermediate host.

The family diagnosis is as follows:

Family HOLOSTOMIDAE E. Blanchard, 1847.

Family diagnosis.—*Holostomata*: Oral sucker terminal or subterminal; ventral sucker usually but slightly developed. Behind the ventral sucker is a peculiar attaching apparatus, varying in shape in different species. The body is commonly divided by a cleft into an anterior and a posterior region. The sex organs are principally in the posterior region and have their common openings at the posterior end in a depression, opening dorsally, called the bursa copulatrix. The oral and ventral suckers, the attaching apparatus, and part or all of the highly developed vitellaria are in the anterior portion. The simple intestinal ceca are without diverticula and extend the entire length of the body. The uterus is but slightly contorted and contains only a small number of relatively large eggs, which develop in water. The adult worms occur in the intestine of mammals, birds and reptiles, rarely in fish and amphibia; the intermediate hosts are mammals, birds, amphibia, fish and mollusks.

Type genus.—*Holostomum* Nitzsch, 1819.

Subfamily ALARIINAE Hall and Wigdor, 1918.

Subfamily diagnosis.—*Holostomidae*: Forms with flattened anterior body portion, of which the lamellar lateral edges are strongly bent ventrally, forming a sort of sac with a long ventral aperture between these lamellar edges. The ventral sucker is often covered by the attaching apparatus and is usually not larger than the oral sucker or the pharynx. (The ventral sucker is lacking in at least one species). The attaching apparatus is in the form of a compact mass, often covering the greater part of the anterior body. The apertures of some glands are at the sides of the oral sucker. The genital cone and bursa copulatrix are notably developed only in exceptional cases. The opening of the bursa is constantly dorsal. Parasitic in birds and mammals.

Type genus.—*Alaria* Schranek, 1788.

Tribe ALARIEAE Hall and Wigdor, 1918.

Tribe diagnosis.—*Alariinae*: With the characters of the subfamily.

Type genus.—*Alaria* Schranek, 1788.

Genus *Alaria* Schranek, 1788.

Generic diagnosis.—*Alarieae*: Posterior portion of the body approximately cylindrical; anterior portion flattened and with its lateral borders curving toward the ventral surface. The ventral sucker is usually larger than the oral sucker. The attaching apparatus is a compact structure which often covers the greater portion of the ventral surface of the anterior part of the body, and may entirely or partly cover the ventral sucker.

Type species.—*Alaria vulpis* Schranek, 1788 (= *Planaria alata* Goeze, 1782, renamed, = *Alaria alata* (Goeze, 1782).

The fluke which we found in 4 dogs (1.33 per cent) of the series of 300 dogs is the larger of our two species and is most closely related to *Alaria alata*, the intestinal fluke from dogs and other carnivores in Europe. We propose for this species the name *Alaria americana*. The smaller of our two flukes, which we found in 3 of our 300 dogs (1.0 per cent), we propose to call *Alaria michiganensis*. The three species may be differentiated as follows:

KEY TO SPECIES OF ALARIA FROM THE DOG

1. No projecting structures at each side of the oral sucker; right testis bilobed, left testis irregular in outline but integral. *Alaria michiganensis*.
Projecting structures at each side of oral sucker; both testes bilobed. 2

2. Attaching apparatus covers the posterior portion of the ventral sucker; the field of the vitellaria extends to the ventral sucker; the ventral sucker slightly larger than the oral sucker.....*Alaria americana*
 Attaching apparatus distinctly posterior to, and not touching or covering, the ventral sucker; the field of the vitellaria in the median line all posterior to the anterior end of the attaching apparatus and to the oral sucker; the oral sucker larger than the ventral sucker....*Alaria alata*.

Part of the above key is based on Brandes' (1890) figures and depends for its accuracy on the accuracy of those figures and of our interpretation of them.

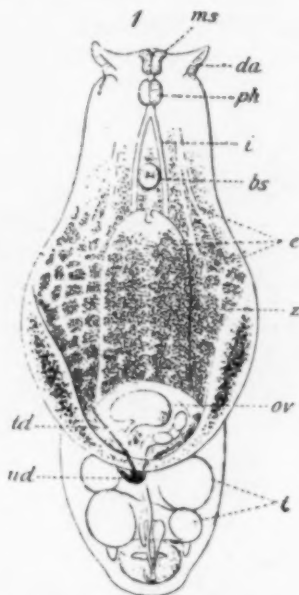


FIGURE 1. *Alaria alata*. Ventral view. *ms*, oral sucker; *da*, site of gland aperture; *ph*, pharynx; *i*, intestine; *bs*, ventral sucker; *e*, excretory system; *z*, vitellaria; *ov*, ovary; *td*, transverse vitelline duct; *ud*, unpaired vitelline duct; *t*, testes. Magnified. After Brandes (1890).

More extended descriptions of these species are as follows:

Species *Alaria alata* (Goeze, 1782) Hall and Wigdor, 1918.

Specific diagnosis.—*Alaria*: Flukes 3 to 6 mm. long (Fig. 1). The posterior body much shorter than the anterior. The oral sucker and pharynx quite distinct and each of them larger than the ventral sucker. Some distance posterior of the ventral sucker is the attaching apparatus, a high structure, notched anteriorly, according to Brandes' figures, and with prominent lateral margins. The greater part of the vitellaria are contained in the attaching apparatus. In the median line there is a row of apparent

cavities, which are actually interruptions in the vitellaria and which are bounded by the dorso-ventral anastomoses of the excretory system. (The cut for Fig. 1 has been tooled in a way that has effaced the representation of these somewhat.) On each side of the oral sucker is a crescentic projection and in these are located the apertures of glands. There is a large bilobed testis on each side of the posterior body. The ovary gives the appearance of being in the anterior body portion, owing to the fact that the lateral lamellae of the flattened anterior portion unite on the ventral surface far back over the cylindrical posterior portion of the body,

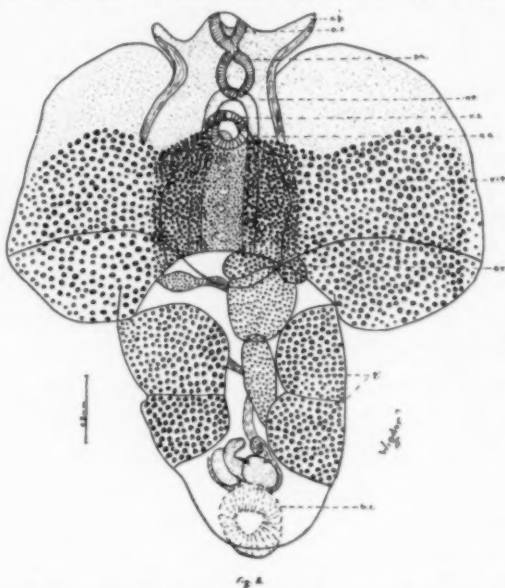


FIG. 2. *Alaria americana*. Ventral view. a. p., anterior projection; o. s., oral sucker; ph., pharynx; int., intestine; v. s., ventral sucker; a. a., attaching apparatus; vit., vitellaria; ov., ovary; t., testes; b. c., bursa copulatrix.

with the entire ovary anterior of the line of union, according to the figure given by Brandes. The uterus and vas deferens open in the middle of a small genital cone. The bursa copulatrix opens dorsally, as in other species of this genus, and is relatively insignificant.

HOSTS.—*Canis familiaris*, *Canis vulpes*, *Canis lupus*, *Canis lagopus*, *Thoas cancrivorus*, and *Megalotis cerdo*.

LOCATION.—Intestines and, occasionally, stomach.

LOCALITY.—Europe. (Natterer is said to have collected it from *Thoas cancrivorus*, which suggests that the fluke was collected in South America).

Species *Alaria americana* Hall and Wigdor, 1918.

SPECIFIC DIAGNOSIS.—*Alaria*: Mounted specimens less than 3 mm. long (Figs. 2 and 5); live specimens appear to be between 4 and 5 mm. long. The posterior portion of the body appears to be shorter than the anterior, but owing to the contractility of the animal, the two parts may appear to be of practically the same length in some specimens. A transverse wrinkling of the cuticle of the equatorial region of the posterior body seems to be common. The oral sucker and pharynx are quite distinct, but their transverse diameters are less than that of the ventral sucker, contrary to the condition in *Alaria alata*. The ventral sucker is relatively

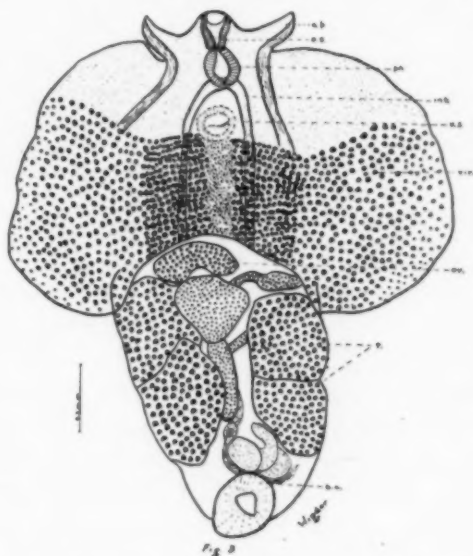


FIG. 3. *Alaria americana*. Dorsal view. Lettering as in Fig. 2.

well forward, less than its own diameter from the angle formed by the intestinal ceca, whereas the sucker in *A. alata* appears to be placed a distance distinctly greater than its own diameter behind this angle. The attaching apparatus is similar to that in *A. alata*, but the anterior end is smoothly rounded and does not show the notch which is figured for *A. alata* by Brandes (1890). In the median line of the vitellaria in the attaching apparatus, there are a series of apparent cavities, not presenting sharply defined, occasionally rectangular outlines as in *A. alata*, and usually 3 to 5 in number and not 9 in number as figured for *A. alata* by Brandes.

In the median line the vitellaria in flattened specimens extend forward to the same transverse plane as the ventral sucker, the attaching apparatus extending slightly forward of the vitellaria and partly covering the ventral sucker. In *A. alata*, the ventral sucker is well forward of the anterior end of the attaching apparatus of the vitellaria in the median line. Specimens which have curled up, apparently in response to some irritant stimulus, show the attaching apparatus shoved forward till its anterior end is in the vicinity of the oral sucker, the lateral lamellae of the anterior body being folded over toward the mid-ventral line, and the posterior body being bent back in a way that tends to bring its dorsal

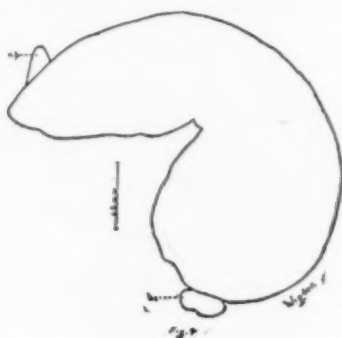


FIG. 4. *Alaria americana*. Outline view from side. a. p., anterior projection; b. c., bursa copulatrix.

portion in contact with the dorsal portion of the anterior body. On each side of the oral sucker are crescentic projections as in *A. alata*, presumably bearing the ducts of glands as the similar structures in *A. alata* are said to do. There is a large bilobed testis on each side of the posterior body. The ovary appears to lie partly anterior to and partly posterior to the line of union of the lateral lamellar margins of the anterior body. The bursa copulatrix is less than twice the diameter of the ventral sucker, whereas in *A. alata* it is about three times the diameter of the ventral sucker, according to Brandes' figures. The eggs in the uterus are $90\ \mu$ to $120\ \mu$ by $80\ \mu$ to $86\ \mu$ in diameter. Eggs from the feces measured $106\ \mu$ to $134\ \mu$ by $64\ \mu$ to $80\ \mu$ (Fig. 5). Other details of the reproductive system and other systems were not determined, as this study was only incidental to other investigations which would not permit of taking time for the work of making and mounting sections.

HOST.—*Canis familiaris*.

LOCATION.—Small intestine.

LOCALITY.—Detroit, Michigan.

The largest number of *A. americana* found in one animal was 91 (in dog No. 281).

Species *Alaria michiganensis* Hall and Wigdor, 1918.

SPECIFIC DIAGNOSIS.—*Alaria*: Flukes 1.8 to 1.91 mm. long when mounted (Figs. 6 and 7). Posterior portion of body longer or shorter than the anterior portion, according to the state of contraction. The anterior portion of the body appears to be covered with minute, posteriorly-directed spines. Well developed oral sucker and pharynx. Oral and ventral suckers of approximately the same size, sometimes one and sometimes the other the larger. The attaching apparatus is usually immediately posterior of the ventral sucker in flattened specimens and has no notch anteriorly.

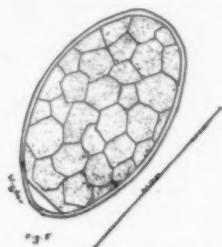


FIG. 5. *Alaria americana*. Egg from feces.

Occasionally it is considerably posterior of the ventral sucker and in a number of mounted specimens we are unable to detect an attaching apparatus. In the median line the vitellaria extend anterior of the ventral sucker to a point between the ventral sucker and the posterior end of the pharynx. There are no such apparent cavities in the median field of the vitellaria as there are in *A. alata* and *A. americana*. There are no crescentic projections on the sides of the oral sucker. The right testis is bilobed and lies transversely across the posterior body, extending across the median line in such a way that one lobe lies on the right side and one lobe lies on the left side of the worm posterior to the left testis. What appears to be the cirrus can be distinguished on the left side, connecting with the bursa copulatrix. The ovary lies somewhat to the left, instead of median, and is entirely posterior of the line of union of the lateral lamellar margins of the anterior part of the body. The transverse vitelline duct crosses to the right side near the

union of the anterior and posterior body and the main vitelline duct extends along the right side of the posterior portion of the body and apparently crosses ventrad of the right testis to the left side, forming a dilation in the median line. The bursa copulatrix is more than twice the diameter of the suckers. The eggs in the uterus are $80\ \mu$ to $104\ \mu$ by $76\ \mu$ to $80\ \mu$ in diameter.

HOST.—*Canis familiaris*.

LOCATION.—Small intestine.

LOCALITY.—Detroit, Mich.

The largest number of *A. michiganensis* found in one animal was 80 (in dog No. 195).

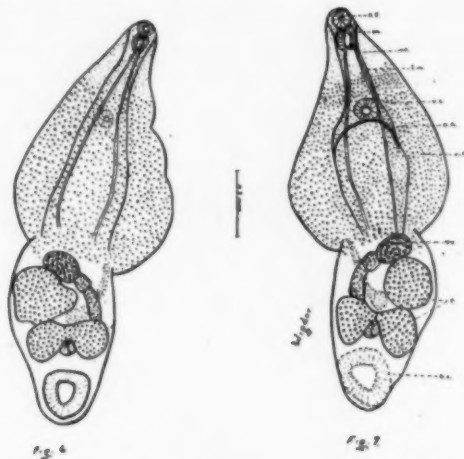


FIG. 6. *Alaria michiganensis*. Dorsal view.

FIG. 7. *Alaria michiganensis*. Ventral view. Lettering as in Fig. 2.

The resemblance between *Alaria alata*, the form described from Europe, and the species we have designated as *A. americana* is very considerable and the possibility of their being the same species should be given consideration. We find certain differences on comparison: Although the measurements overlap, *A. alata* appears to be larger as regards average size and maximum size. In *A. americana* the vitellaria in the median line and the anterior border of the attaching apparatus both lie in the transverse field determined by the antero-posterior diameter of the ventral sucker, whereas in *A. alata* the ventral sucker lies anterior of the forward end of the attaching apparatus, which in turn seems to extend well forward of the anterior limits of the vitellaria in the median line. This difference, the absence of a notch in the anterior margin of

the attaching apparatus, and a few other differences in relative sizes of suckers, etc., make it unwise to claim the identity of the European and American form. In this matter we follow the advice of Dr. Ch. Wardell Stiles, who considers it better to take a chance on making a new species for an old one, where there is a doubt, and assuming that an error will be pointed out and the new name assigned its proper status as a synonym, than to record such a doubtful finding under the name of an old species with which it may easily be long confused and from which it will be very difficult to separate it if there is an error.

The measurements of mounted specimens of the two American species of flukes are given in the following table, nothing of the sort, except the body length of 3 to 6 mm., being known to us for *A. alata*:

| Structure | <i>A. americana</i> | | | <i>A. michiganensis</i> | | |
|------------------|---------------------|--------|-----------------|-------------------------|--------|-----------------|
| Entire body | 1.16 | mm. to | 2.32 mm. long | 1.89 | mm. to | 1.91 mm. long |
| Anterior body | 0.69 | mm. to | 1.07 mm. long | 0.80 | mm. to | 1.17 mm. long |
| | 0.71 | mm. to | 1.95 mm. wide | 0.85 | mm. to | 0.94 mm. wide |
| Posterior body | 0.48 | mm. to | 1.25 mm. long | 0.72 | mm. to | 1.11 mm. long |
| | 0.65 | mm. to | 0.95 mm. wide | 0.85 | mm. to | 0.92 mm. wide |
| Oral sucker | 0.090 | mm. to | 0.137 mm. diam. | 0.086 | mm. to | 0.157 mm. diam. |
| Pharynx | 0.120 | mm. to | 0.196 mm. long | 0.142 | mm. to | 0.152 mm. long |
| | 0.080 | mm. to | 0.137 mm. wide | 0.118 | mm. to | 0.127 mm. wide |
| Ventral sucker | 0.070 | mm. to | 0.176 mm. diam. | 0.090 | mm. to | 0.176 mm. diam. |
| Bursa copulatrix | 0.114 | mm. to | 0.245 mm. diam. | 0.088 | mm. to | 0.235 mm. diam. |

The flukes reported from the dog outside of North America include the following: *Opisthorchis felineus*, *Opisthorchis caninus*, *Clonorchis endemicus*, *Metorchis albidus* (?), *Pseudamphistomum truncatum*, *Ascocotyle minuta*, *Ascocotyle italica*, *Loossia romanica*, *Heterophyes heterophyes*, *Heterophyes aequalis*, *Heterophyes dispar*, *Isthmiophora melis* (?), *Echinochasmus perfoliatus*, *Dicrocoelium dendriticum*, *Schistosomum japonicum*, *Yokagawa yokagawa* and *Hemistomum alatum*.

In passing it is of interest to note that Stiles and Hassall (1894) report the presence of *Hemistomum alatum* in the collection of the U. S. Bureau of Animal Industry at Washington, D. C., but the material is European, not American. The specimens are from Rudolphi's collection and probably have an historical interest far greater than their scientific value for study after preservation for a century; no effort was made to examine this material for comparison.

BIBLIOGRAPHY

- BRANDES, GUSTAV. 1890. Die Familie der Holostomiden. *Zool. Jahrb., Abt. f. Syst.*, v. 5 (4), 24, Dec., pp. 549-604, pls. 39-41.
- RAILLIET, ALCIDE. 1896. Quelques rectifications à la nomenclature des parasites. *Rec. de Méd. Vét.*, v. 73, 8 s., v. 3 (5), 15 mars, pp. 157-161.
- STILES, CH. WARDELL, and ALBERT HASSALL. 1894. A preliminary catalogue of the parasites contained in the collections of the United States Bureau of Animal Industry, United States Army Medical Museum, Biological Department of the University of Pennsylvania (Coll. Leidy) and in Coll. Stiles and Coll. Hassall. *Vet. Mag., Phila.*, v. 1, (4), Apr., pp. 245-253; (5), May, pp. 331-354.
1908. Index-catalogue of medical and veterinary zoology. Subjects: Trematoda and trematode diseases. *Hyg. Lab. Bull.* (37), 401 pp.
- WARD, HENRY B., and HIRSCH, EDWIN F. 1915. The species of *Paragonimus* and their differentiation. *Ann. Trop. Med. & Parasitol.*, v. 9 (1), Mar., pp. 109-162, pls. 7-11.

A NEW CENTER FOR VETERINARY RESEARCH

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It will be of interest to veterinarians to learn that very recently steps have been taken at the Army Medical Museum, of the Surgeon General's Office at Washington, to improve the status and further the interests of veterinary science in that institution. As in the case of so many activities, the present war is largely responsible for giving greater prominence to this important department of science. Our armies are using a great number of horses and mules, not only in the cavalry service, but as draught animals and for other purposes. It also becomes a matter of great importance that the veterinary department of the Government should bestow the strictest attention to the meats that are issued to our men and officers in France as well as in this country—a precautionary measure that is too obvious to require any debate in this place. Finally, we have come to use the dog in many capacities at the front, and dogs require that just as much care is bestowed upon them as do men, in that they may be kept fit for service and ready for duty at all times.

With these activities and necessities before the Government, it will be a surprise to no one to learn that, with the means so conveniently at hand, the required action was promptly taken to meet

what was so obviously demanded in the premises, in that efficiency and the requirements of hygiene might be realized to the fullest extent. To deal with the problems of practice and therapeutics, in so far as they apply to the care of any one of our domestic animals, it is clear that such an institution as an army medical museum can undertake but certain steps in the matters of teaching and the exhibition of material, in that officers and men of the veterinary service may profit by what is placed within their reach.

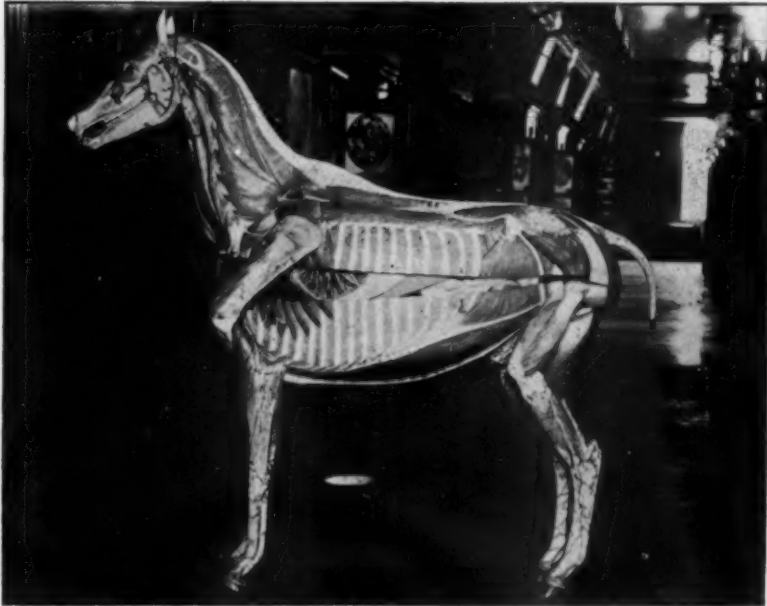


FIG. 1. Life-size manikin or model of a horse, manufactured by Auzoux of Paris; muscles, organs, etc., all detachable. Circulatory system, etc., perfect.

This applies, however, with equal truth in the case of our own species, be they civil or military subjects. By this is meant that a medical museum fully serves its end when it has properly placed on exhibition all the material that it can accumulate, and all that its space will accommodate, which brings before the student and the practitioner the morphology and physiology of the forms they strive to maintain in as thoroughly healthy a condition as possible, and render of the greatest service to their kind; these elements of structure and function are likewise fully illustrated with respect to their pathological condition. When these ends are met to the fullest extent, there is but little left for a medical museum to do,

beyond thoroughly keeping abreast of the profession's advance, and offering all possible facilities for educational extension, through employing, for teaching purposes, all the material the institution contains.

This last statement is as true of veterinary science and its demonstrational material as it is of the corresponding collections as they relate to our own or any other species, when we come to apply it to the teaching of the professional branches of that department of learning.

We may now pass to a brief consideration of such specimens



FIG. 2. A very ingenious contrivance to show the age of a horse by the teeth. Anterior parts of the actual maxillæ (upper and lower jaws) of five horses, so hinged that they can be shut together. Anterior teeth all perfect, the characters showing the ages of this animal at 11, 12, 16, 18 and 20 years. (Nos. 749-753.) Dr. Brailey, Vet. Surg., U. S. A., contributor.

as are to be found in the Army Medical Museum, and the facilities it offers for study and research work. In the first place, there are to be found in the library of this institution several hundred standard works, devoted to the various branches of veterinary science, while the reading room receives many of the leading journals on such subjects. These works are regularly loaned to veterinarians under the same rules and restrictions as are medical works to physicians and surgeons on our own species. Later on, when the proposed new Army Medical Museum becomes an accomplished fact, there will be dissecting rooms for veterinary students and practi-

tioners, as well as facilities for microscopical and pathological research and case examinations; but it is a little too early to look for such advantages as these. When we turn to the collections, however, it will at once be appreciated that the museum has taken a long step in the direction of laying the foundation upon which to build up this part of the requirement for investigations in veterinary science.

One of the most expensive as well as one of the most useful specimens in the museum is that of a model of a horse, here shown



FIG. 3. Right innominate bone of a horse exhibiting a case of comminuted fracture, involving the acetabulum. Result of a fall. Animal was at once killed. (No. 9663.)

in Fig. 1. This is an Auzoux of Paris, and was purchased a long time ago. It occupies an entire special glass case all to itself, and is of the size of life. Nearly all of its anatomical parts are detachable, thus affording students and demonstrators opportunity to handle them separately. This does not apply to the superficial muscles and other parts exclusively, for the model is so constructed that it opens up entirely along the horizontal plane shown in the cut. When thus opened, all of the internal organs and viscera may be taken out, piece by piece, allowing the form and relations of

each organ to be studied separately. A model of this sort is of some value when studied through the four sides of its big glass case; but it would be of far greater value were it used in a room where veterinary lectures on equine anatomy were being delivered regularly, and the class of students had the opportunity to take it apart. Such a lecture-hall will doubtless form a part of the proposed new



FIG. 4. Right carpal bones and proximal end of metatarsus, showing large exostotic growths. From a mare, age 15 years, which fell, injuring the joint. Synovitis ensued. (No. 10657.) Contributor C. B. Robinson, V.S., Washington, D. C.

building, and it should be a modern room with respect to acoustics, lighting, and size. It goes without the saying that such an auditorium or lecture-hall could be used for all lectures pertaining to the various activities that the institution exploits; in fact, no museum worthy of the name would in any way be complete without it.

We further find in the collections of the museum now being

considered many fine Auzoux models of separate organs of many different species of animals other than those of the horse. Not a few of these are several times their normal size and very perfect in their way. The increase of size is often of advantage; for, in the case of large audiences, those far from the lecturer's desk may be able to see the model and its smaller parts. Such a series of models should be sufficiently extensive to make necessary comparisons. For example, the stomach of a horse, a cow, a pig, and several carnivores, should all be thus compared and intercompared. Anatomy attains its full teaching value only when every structure is contrasted with the same structure of all animals in any way related to the one being described. Without this, philosophy gives way before the incomprehensive single-species method, which is now gradually being abandoned in centers of such instruction at all worthy of the name.

The teeth of horses have always held an important place in the study of the animal, particularly as they materially assist in determining the age of the species, which is an important factor in the marketing of horses, or the buying of a large number of them by the government for use in the Army. In Fig. 2 is given a device that fills a useful purpose in this matter, and one that is a good demonstration model for class work.

There are many specimens in the cases of a teratological nature, and these refer not only to the horse but to the majority of our domestic animals; they are wonderfully varied in character, and of great interest, especially those of the skull and the feet (polydactylism). Osteologically they are of value when compared with similar departures from the normal, as we find them to occur in our own species and among the lower types of mankind.

—Dr. Richard Ebbitt has removed from Grand Island to Papillion, Nebraska.

—Dr. G. H. Grapp has removed from Port Deposit to Baltimore, Md.

—Dr. T. E. Wilke has removed from West Plains, Mo., to Chicago, Ill.

—Dr. A. J. Dinse has been transferred from Warrenton to Hamilton, Ga.

SOME BLOOD-SUCKING FLIES OF SASKATCHEWAN

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Technical Assistant, Entomological Branch, Department of Agriculture

INTRODUCTION. Last summer (1917) the author in cooperation with Dr. S. Hadwen of the Health of Animals Branch, Department of Agriculture, made a preliminary survey of the blood-sucking flies affecting stock and man in the vicinity of Saskatoon. Because of other important investigations occupying their attention, including the study of bot-flies, and so-called "swamp fever" which causes serious losses among horses, the time allotted to the survey was necessarily limited. It is therefore proposed to discuss tentatively only a few of the more frequently occurring forms that were encountered within a radius of 50 miles of the city of Saskatoon, Sask. Inasmuch as the environmental conditions existing in this area are fairly representative of those throughout the southern half of the province, the remarks that follow will be found to be more or less applicable to the whole of this region, where wooded bluffs are relatively few and far between. In the northern territory, as yet unexplored by the author, it is not unlikely that in the more sheltered wooded districts, more favorable environmental conditions will prove such as to have an important bearing on the constitution of the fauna of blood-sucking flies, with a probable consequent greater fertility in species numbers. It could not but be remarked that the area studied yielded a surprising paucity of form especially of horse-flies, although in actual numbers their dominance could not be denied.

Attention was principally paid to the three families known as the Culicidae or Mosquitoes, the Simuliidae or Black-flies and the Tabanidae or Horse-flies, all of which have aquatic larvae.

MOSQUITOES.* Until Knab published his paper "Observations on the Mosquitoes of Saskatchewan", Smithsonian Miscellaneous Collections, Vol. 50, Pt. 4, 1903, pp. 540-547, very little was known about the prairie species or their habits. There still remains much to be learned. The great majority of the species of the prairie region of the northwest belong to the genus *Aedes*. These typically northern forms develop in the melting snow-water of early spring.

To some, the great abundance of the prairie mosquitoes has pre-

*The author desires to express his thanks to Dr. H. G. Dyar of the Smithsonian Institution, Washington, D. C., for kindly identifying the species of mosquitoes.

sented a puzzling question because of the comparative scarcity of water—essential to mosquito breeding—on the prairies during the summer months. There is only a single annual brood of prairie mosquitoes, and the adults are apparently long lived. The eggs are laid in the late summer on the ground where they remain until the following spring, when they readily hatch into “wrigglers” in the water produced from the melting snow. Many sloughs persist well into the summer, but frequent investigation during July and August failed to reveal the presence of larvae in these stagnant waters, the first and only generation having departed earlier. Knab, however, found the larvae in large numbers in alkali swamps and ditches in May and June (1907). In one or two instances *Aedes canadensis* Theob. and *Aedes sansoni* D. and K., were particularly prevalent in the immediate vicinity of these sloughs during July. Peculiar to swampy creeks and ravines opening into the Saskatchewan River one finds *Aedes mimesis* Dyar, *Aedes vexans* Meig., and *Aedes aestivali* Dyar, all of which are more or less persistent in their attacks on man. *A. canadensis* and *A. sansoni* were occasionally encountered in large swarms when disturbed from their shaded resting places among the grasses in these ravines.

The most widely distributed species on the prairies are *Aedes spenceri* Theob., *Aedes fletcheri* Coq. and *Aedes curriei* Coq. The first two are very prevalent around Saskatoon, and it is principally due to their vicious habits that the existence of the prairie inhabitants is rendered almost intolerable at times. They are rarely to be encountered in the towns, although they enter the porches of houses on the outskirts and attack the occupants. Their attacks on stock are equally troublesome, and the provision of protective fly-nets on horses is a wise precaution now generally adopted.

From the nature of the life-history facts here outlined, it will be readily imagined how difficult is the problem of mosquito control on the prairies. None of the species appear to undertake long migratory flights so that the problem is more or less a local one, but a local one of immense size. Undoubtedly, much could be accomplished in the vicinity of townships by oiling the temporary pools of the early spring wherever larvae are found. The judicious application of kerosene, crude oils of paraffin or asphaltum base will provide a surface film which will readily kill the larvae by suffocation as well as by their toxic properties. An alternative method, which has been employed in anti-mosquito work with great effect, is the application

of a preparation known as "larvacide" manufactured according to the following formula:*

| | |
|---------------------|-------------------|
| Resin..... | 150 to 200 pounds |
| Soda (caustic)..... | 30 pounds |
| Carbolic acid..... | 150 gallons |

The product readily emulsifies in water, but unfortunately brackish or alkali waters render it inert. Combined with its marked toxicity, it has the advantage of cheapness, a fact which makes it preferable to the more expensive kerosene oil.

Sloughs near towns should be readily filled up with refuse wherever possible, the work to be accomplished during the summer and fall in preparation for the thawing of the following spring.

BLACK-FLIES. The virulence of the bite which the species of this family are capable of inflicting is in inverse ratio to their size. In different parts of the continent they are known variously as "buffalo-gnats", "turkey-gnats" and "sand-flies", but the designation of black-flies is by far the most suitable in that it is not so narrow in its content as the others, each of which emphasises one particular habit of a single or limited number of species.

In the early stages of their life-histories black-flies are aquatic and their gregarious, greenish-gray larvae may be found attached to stones in the rapids of streams and rivers. They maintain their position in spite of the current by means of a suctorial disk at the posterior end of their body, and by means of the peculiarly adapted head-fans they contrive to sweep minute vegetable organisms such as diatoms and desmids into their mouths. Should they, by any chance, become dislodged from the security of their position, they have the power of secreting a silk-thread. By fixing it to a stationary object, the chances of their being washed downstream before they encounter another suitable anchorage are considerably decreased.

Before pupating the larva spins a closely-woven, slipper-shaped cocoon, open anteriorly. It is securely fixed to the stones, and the thread-like breathing filaments are exposed.

The velvety black-flies lay their eggs on the exposed surfaces of stones or weeds, and some penetrate beneath the surface to deposit their eggs on the water-washed surface of stones. The whole life-history occupies a period of about six weeks.

*Le Prince, J. A., and Orensteen, A. J., *Mosquito Control in Panama*, New York, 1916, p. 174.

We were able to witness how intense is the annoyance and injury inflicted on cattle by the persistent and tenacious attacks by myriads of these black-flies. At the beginning of July, the species most abundant was *Simulium similis* Mall. On the evening of July 4 some cows staked out on the prairie in close proximity to the Saskatchewan River and not more than two miles from Saskatoon, were observed to be straining on their tethers and lowing pitifully. A closer view revealed the presence of dense swarms of this species, which extended all round the animals for at least eight to ten yards. The animals were very restless, and a close examination revealed the fact that on their forequarters, abdomen, and udders, the flies were congregated in dense masses and were distended with blood. On these regions the skin was broken, and blood oozed from innumerable punctures. The flies were also entering the nostrils, ears and eyes.

The damage caused by black-flies results from their painful bites and the loss of blood which ensues. They have frequently been guilty of inflicting extensive losses among livestock, but so far have not been incriminated as vectors of disease-causing organisms. At Duck Lake in Saskatchewan it was stated on good authority that in 1913 about 100 head of cattle died from the attacks of black-flies. The first swarms are generally in evidence about the beginning of June, and the infestations may recur at intervals as late as September and October. One witness testified to the pungent, mustard-like taste of the flies.

The Saskatchewan River, the only apparently suitable water for the breeding of black-flies, is six miles distant from Duck Lake and there is little doubt but that the flies either voluntarily or compulsorily undertake migratory flights which carry them long distances from their places of breeding. Probably they are assisted in this by mild, favoring breezes.

At the present time the only measure of control that commends itself is either to burn "smudges"—which many farmers do—and thus ward off the flies from the animals by the resulting dense smoke, around which they congregate for protection, or to dress their coats with some disagreeable preparation of oil or grease. Fish oil alone or in combination with other strong-smelling substances is one of the best repellants. A mixture* consisting of three parts of fish oil

*Washburn, F. L., *Diptera of Minnesota*, Bulletin N. 93, Agr. Exper. Sta., Univ. Minn., 1905, pp. 75-76.

and 1 part kerosene spread over sores gives excellent results. In smearing animals with the various strong-smelling oils care should be taken not to use machine oil or other powerful oils, the repeated application of which tends to remove the hair. The dressing should be renewed once a day in the fly season.

The most satisfactory means of control would be to kill the larvae in the streams, but in large rivers the practicability of making any extensive application of toxic substances is out of the question. Further, the danger to stock and human beings, who may use the treated water, must be duly emphasized. In some experiments recently carried out with Phinotas oil** in streams, it was found that a film of oil may be found upon stones 48 hours after application, and the black-fly larvae may be killed one-eighth of a mile below the point of application.

A small stream which drains a swampy area and debouches into the Saskatchewan River, about 3 miles south of Saskatoon, was found to contain the larvae of three different kinds of black-fly and, in this particular instance, treatment with Phinotas oil would have supplied the necessary remedy.

HORSE-FLIES. The flies belonging to this family are also variously known as breeze-flies, elegs and deer-flies. The name, however, by which the larger horse-flies of the prairies are most generally known is "bull-dogs", which conveys some idea of their pertinacious biting habits. The adults frequent marshy places and are commonly encountered in the vicinity of sloughs in large numbers. Here they lay their eggs on the leaves of aquatic plants, and the larvae inhabit the muddy bottoms and margins of these ponds. The larvae are carnivorous, preying upon slugs, worms and the larvae of other insects, whilst in captivity they do not hesitate to devour their own kind.

The most prevalently occurring species in the environment of Saskatoon is *Tabanus septentrionalis* Loew., which is extremely variable in its coloration and size. It was our experience that this species displayed a marked tendency to seek shade. When an automobile was stationed near a slough with the cover up, they swarmed around it in large numbers, circling it in rapid flight and finally entering and resting on the roof or on the mud-guards and sides

**Phinotas oil is a preparation made by the Phinotas Chemical Company of New York and is a powerful larvicide. The great objection to its use is that fish also succumb to its poisonous properties. It costs about 40 cents per gallon (Smith, J. B., Mosquitoes of New Jersey, Trenton, N. J., 1904, pp. 128, 129).

outside. By the same token, they were often found at rest on the outside walls of dwelling-houses and inside on the windows, associated with *Tabanus illotus* O. S., and *Tabanus hirtulus* Bigot. In lesser numbers *Tabanus phaenops* O. S., *Tabanus rhombicus* O. S., *Tabanus cantonis* Marten, and *Tabanus epistatus* also occurred.

None of these species were found to be aggressive in their attitude to human beings, but they were persistent in their attacks on horses and cattle grazing on the prairies. The provision of fly-nets for horses at work is ample protection against these flies.

Of the genus *Chrysops*, all of which have pictured wings, *Chrysops moerens* Walk. and *Chrysops fulvaster* O. S. were the only two species found during the summer. Around the sloughs near Dundurn the former was very common. In the grass at the margins of these sloughs, they were readily disturbed as one walked along and they were not slow to attack human beings. The latter was only encountered in low, swampy ground and was taken in large numbers. It does not hesitate to attack those who intrude in its preserves.

The delicate, grayish-black breeze-fly *Haematopota americana* O. S., with grayish pictured wings, is occasionally found around horses and readily settles on people in the vicinity. In its flight it makes very little noise and it is very quiet and unobtrusive as it settles to bite.

For those horse flies which attack the ears of horses nets will be found useful as a protection. In case where the eyes are also attacked, the ears and skin about the eyes may be smeared with the following repellant solution as recommended in Bull. No. 93, Agr. Exper. Station, Univ. Minn., 1905: Pine tar one gallon; kerosene or fish oil, or crude carbolic acid one quart; powdered sulphur two pounds. This mixture, also, applied to wounds made by barbed wire or otherwise, will ward off those flies which might be disposed to lay their eggs therein.

In Russia, Portchinsky* has taken advantage of the habits of

*Portchinsky, L. Tabanidae and the Simplest Methods of Destroying Them. Memoirs of the Bureau of Entomology of the Scientific Committee of the Central Board of Land Administration and Agriculture, Petrograd, Vol. II, No. 8, 1915. Abstract in Rev. App. Entom., Ser. B., Vol. III, 1915, pp. 195-196, 1916.

Dr. L. O. Howard, Bureau of Entomology, Washington, D. C., was the first to attract attention to Portchinsky's discovery in "A Remedy for Gadflies; Portchinsky's Recent Discovery in Russia, with Some American Observations". This was published in Bulletin No. 20, Division of Entomology, United States Department of Agriculture, 1899. The Russian author had previously published an account of his findings this same year.

horse-flies of concentrating in damp places and near pools at which they drink. He found that during the heat of the day the flies rapidly skim the surface of the water in order to drink, only the underside of their bodies touching the water. Very good results were obtained by pouring kerosene on the surface of these pools of stagnant water, and it was found that these "pools of death", as he called them, soon became covered with the dead bodies of horse-flies which frequented them. Contact with the kerosene, which adhered to their bodies, rapidly poisoned or suffocated the flies. The author advocates the use of "pools of death" in pastures where cattle graze, but they should always be securely fenced off.

In Canada, Mr. Norman Criddle of the Entomological Branch, Manitoba, made independent observations and experiments in 1914 and 1916 in Manitoba similar to those of Portchinsky in Russia. In 1914 he noticed the habits which horse-flies display of making rapid, skimming flights along the surface of exposed water. Like the Russian author, too, he found that the great majority of the flies that thus behaved were males, only a small percentage of females coming to drink at open water. In experiments covering a period of 5 days in a pool but one square metre in surface area, Portchinsky counted in all 1967 horse-flies, of which only 14 per cent were females.

My thanks are due to Professor J. S. Hine, Ohio State University, who kindly confirmed the identification of some of the specimens of horse-flies and also named others about which there was some uncertainty.

—Veterinary Inspector D. B. Pellette has been transferred from Oxford, Ala., to Colfax, La.

—MAKING THE CATTLE TICK HOOVERIZE. While civilians are depriving themselves of meat, so that our soldiers and our allies may have sufficient meat rations, the cattle tick is also compelled to give up his continuous meal of cow blood in counties doing Tick Eradication work.

During the past month 698 vats were used and 275,000 cattle dipped for ticks in South Texas. Every tick gotten rid of by the dipping means that much blood saved for beef production.

—The marriage of Miss Lois Mary Smith of Columbus, Ohio, to Dr. J. P. Scott of Manhattan, Kansas, is announced. Dr. Scott is on the staff of the Veterinary College at Manhattan.

ORGANIZING AND CONDUCTING STATE-WIDE TICK ERADICATION IN LOUISIANA

ERNEST I. SMITH, D.V.M.
Inspector in Charge, B. A. I.
Baton Rouge, Louisiana

On July 25, 1917, Hon. Ruffin G. Pleasant, the distinguished Governor of the State of Louisiana, signed and approved one of the greatest constructive measures ever passed by any legislative body. It is known as Act No. 25, Senate Bill No. 10, by Senator Norris C. Williamson, under the caption as follows:

AN ACT

To provide for the eradication of the Texas fever carrying tick, commonly known as the cattle tick, (*Margaropus annulatus*); to provide for the expenses of conducting and carrying out said work in the State of Louisiana; to provide process to compel compliance by Police Juries and the members thereof with the provisions of this Act; and prescribing the manner in which Live Stock Sanitary Inspectors shall be appointed and compensated; defining their duties and fixing the authority of the Louisiana State Live Stock Sanitary Board relative to cattle fever tick eradication in the State of Louisiana, and to provide penalties for the violation of this Act; and to repeal Act 127 of the General Assembly of Louisiana for the year of 1916; and all laws or parts of laws in conflict with this Act.

During the time the bill was on trial before the agricultural committees of the Senate and the House, planters, cattlemen and others in the State hastily sent to their various law-makers a flood of telegrams urging them to make a favorable report, which proved beyond a reasonable doubt that the majority were desirous that such an indictment be drawn against the tick sufficient to insure that no competent jury could ever succeed in returning a verdict of acquittal. The language in the Act had been carefully phrased to affect every parish in the State, in the event those already released should become reinfested. However, it directly affected forty-two new parishes which, heretofore, had never taken any official action along the lines of tick eradication.

The proper legislation was finally enacted, and it specifically stated that all parishes must be equipped with sufficient number of

vats and chemicals to commence systematic tick eradication by April 1, 1918. The gigantic wheels of progress began to revolve, and in order to smoothly pave the highway of success in advance, it became immediately imperative for Dr. E. P. Flower, Secretary and Executive Officer of the Louisiana Live Stock Sanitary Board and the Bureau forces to make a survey of every one of the forty-two new parishes, meet their governing bodies on scheduled dates and explain to them the fundamental principles of the law. Notably, their part in the undertaking; what the State would do, and what would be the attitude of the United States Bureau of Animal Industry. This procedure was a campaign within itself which forced many fat mileage books to swiftly fall away into two thin pasteboard covers.

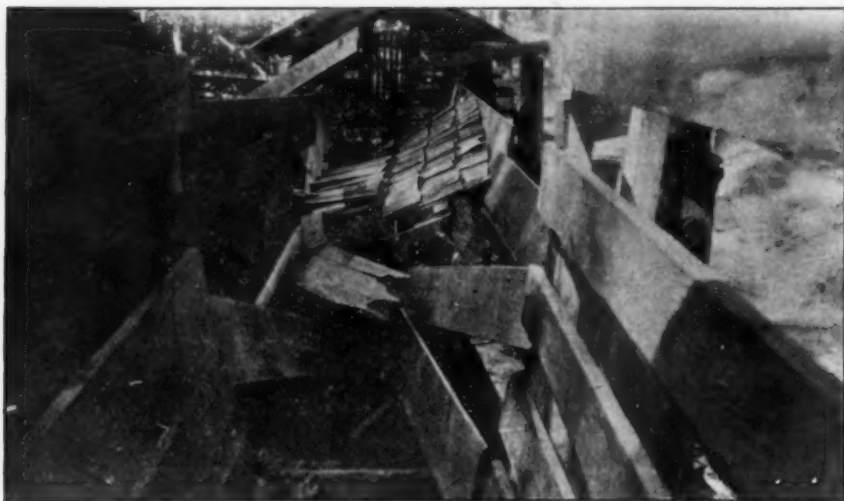


FIG. 1. A miscreant dynamites a dipping vat
Photographed by C. F. Lipp

In the meantime, executive bodies summoned our assistance, and in a number of instances, special sessions were called for the purpose of conserving time. We were extended a cordial reception by each local executive board and, as a result of the conference, they immediately made arrangements for a liberal appropriation to build vats, purchase chemicals and provide for local inspectors to work under the direction of the federal supervising inspector.

In the early winter, many of the parishes began to call for a leader to aid them in locating the vats and explain the details of construction. Then an efficient Bureau organization had to be as-

sembled and systematized to meet the requirements in order that every parish might have close individual supervision including fifteen other parishes which had carried on the work in 1917 under a local ordinance with not the highest degree of efficiency.

In November, 1917, vat building made a small but healthy start and so continued until it reached the climax, when during the month of April, 1918, alone, the various parishes over the State, both by cooperative labor and the contract system constructed, complete, ready for instant operation, eight hundred and twenty-seven dipping vats. Adding this number to those which had been previously constructed and to those which have been built since May 1st, makes the splendid total of about five thousand for the entire State.



FIG. 2. Along the dusty road to the dipping vat

In consequence of this great number of vats, chemicals have been purchased by all the parishes equivalent to about one hundred and fifty tons of white arsenic.

The machinery has now speeded up to the point where the Bureau has sixty-five employees in Louisiana consecrated to the service of tick eradication, and the State and parish furnish between six and seven hundred more. The State-wide law did not become effective until April 1st, 1918, but notwithstanding that fact, our records show 250,000 dippings under supervision during the month of March and in April the figures leaped to 1,700,000 with the machinery running smoothly and capable of trebling the load. As horses and mules harbor the tick, they were not overlooked and many of them

took their regular swim through the vats with the usual joy of satisfaction.

In one parish a few miscreants from the piney woods resorted to dynamite to help the cause along, but their un-American, cowardly tactics precipitated a reaction which resulted in the Chief Executive of the State informing the local officials to prosecute to the

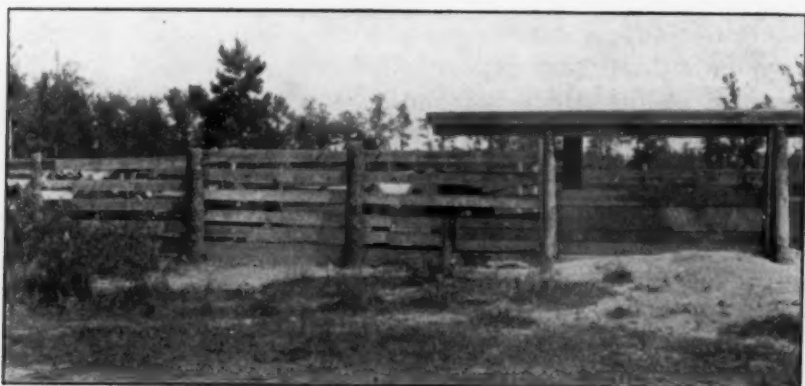


FIG. 3. Ready to plunge in



FIG. 4. Thoroughly cleansed to the skin

limit any individuals who exhibited an ugly face toward tick eradication by cooperating with dynamite. Act No. 68 passed by the 65th Congress played an important part, in that it forbade any individual from having in his possession explosives, except he be licensed accordingly by the federal government.

The busy season has arrived and soon after sunrise if one were in the proper place, large herds of cattle could be observed hurry-

ing along the dusty road to their semi-monthly bath, and when they arrive there is little left to do but head them toward the chute leading to the dip where they will plunge in safely, one after another with accurate precision and finally come out of the dripping pen at the other end of the vat thoroughly cleansed to the skin and the tick



FIG. 5. Free rangers from the piney woods



FIG. 6. With horns too broad to dip

administered a powerful toxic dose, sufficient to kill it within the next forty-eight hours.

The vast areas of cutover pine lands in Louisiana furnish excellent grazing for thousands of cattle and to the student and lover of nature it is interesting to hear the first faint tinkle of bells some-

where in the dense woodland. Finally, the medley becomes louder, sounding like a thousand bells of all dimensions attached to so many wild beasts of the jungle. Suddenly the free rangers break out into the open and, with the horseback riders in the rear, leisurely wend their way to the vat pens for the ultimate purpose of breaking the long, uninterrupted game of extortion played by the tick in its annual toll of death.

In a State-wide campaign of cattle dipping it would, indeed, be very exceptional if we were unable to find a steer with natural instruments of defense too broad to permit him to pass through the vat without his horns becoming locked between the walls. He is a

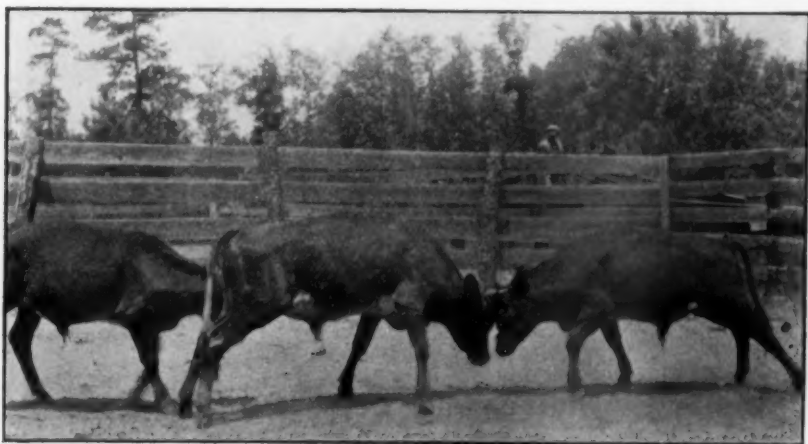


FIG. 7. Two native gladiators

descendant of the early bovine settlers of Texas when the cattlemen bred largely to horns and head. Nevertheless his generous equipment of horns does not permit him to escape the treatment; he is placed in the dripping pen, given a good shower bath and, as a result, he apparently craves to be normal so he could follow the regular procession through the vat.

In the common cause to eliminate the dreaded cattle tick the regular herding of cattle for each dip day has its perplexities and amusements. The man who rides all day through thick bushes, shrubs, and sharp briars, in and out of the almost impenetrable jungles and finally lands his cattle at the vat by nightfall, deserves much credit and consideration. It is an undertaking that will, temporarily, ruffle the most gentle disposition. However, after dipping

and the day's work is completed, the humorous side may present itself, as it is not an infrequent sight to see two native gladiators from the piney woods, with their referee, striving to decide who shall be master of the open range for the next two weeks.

Tick eradication this year in Louisiana is, undoubtedly, the most gigantic undertaking ever inaugurated by the Bureau in any one state. Previously, the opportunity to do any preliminary work had not presented itself and, as mentioned above, forty-two new parishes had never spent a single dollar from their treasury to build vats for the purpose of educating the people to the advantages of dipping. After all, the people throughout the entire state had absorbed considerable knowledge about the tick, either from the press, or listening to others discuss the situation. In this connection it may appear that Louisiana has exploded the theory that years of preliminary effort is necessary before systematic work can commence, but the fact must be remembered, and ever kept vividly before the eye, that the Pelican State has a distinguished leader in veterinary science who has never lost an opportunity to show the great commonwealth how they could better their sanitary conditions. Dr. W. H. Dalrymple has contributed his full share toward preparing the way for state-wide tick eradication and to him the people owe much, much more than they can ever repay.

The only practical solution of tick eradication is a State-wide act, and after its passage, it is amusing to note how quickly some of the most backward parishes will meekly fall in line and be the strongest coöperators. If the existence of the tick is left to local option, scattering territory can only be cleaned up, which leaves annoying border lines to contend with, and a mass of obstinate people no stronger for the work than in the beginning. When the tick is a menace to all the country, no class of ignorant and prejudiced citizens should be delegated the power at the ballot box to decide the destiny of the cattle industry.

—Dr. V. W. Knowles, formerly of Little Rock, Ark., has taken up veterinary practice at Livingston, Mont.

—Veterinary Inspector H. T. Juen has been transferred from Chicago, Ill., to El Paso, Texas.

—Dr. V. H. Knutzen has removed from Cleveland, Miss., to Chicot, Ark.

DIPLOMACY IN THE FIELD*

EDWARD HORSTMAN, Veterinary Inspector

Diplomacy in the field, or diplomacy in any branch of industrial life, is characterized by special tact in the management of affairs. We cannot all hope to excel in this quality, because we may not be sufficiently skilled in the art of handling men and affairs, but an inspector in the field has a wonderful range for using good judgment or tact if he will stop to study the man he is attempting to persuade to dip his cattle.

There are two sides to tick eradication work. The mechanical side consists of building vats, making solutions and dipping cattle, and if there is no opposition to the dipping everything goes along smoothly and satisfactorily. However, where opposition arises, there is need of action of some sort. The first impulse is to resort to the law and make the objector dip. Some inspectors have a motto of "dip or affidavit", but that is not the wisest plan to follow in any instance. An inspector who cannot differentiate between the obstinate anti-dipper and the one who merely lacks knowledge of the benefits and necessity of dipping will not prove a success as an inspector. We must not forget the fact that none of us are infallible, and that the cattle owner has his own ideas, sometimes peculiar, no doubt, but he is entitled to an opinion, and it is up to the inspector to dislodge him from his false notions about not dipping. His opinion should be respected, but he should be told that in justice to himself he should first recognize the facts as regards the ultimate aims of tick eradication and so leave his mind open to conviction before he comes to a final conclusion.

It must be remembered that not so very long ago the Southern plantation owner was practically a king on his own plantation, and that feeling in a measure is still present, consequently nothing is so obnoxious to the Southerner as to be told or made to feel that he must do certain things which he considers unnecessary. Compulsion grates on his nerves, so, as an inspector, it is wise diplomacy to get away from force as far as possible and to picture by alluring words the benefits of eradication of ticks, the upbuilding of the cattle industries, increased prices and the cessation of dipping when the last

*Address delivered at the meeting of Inspectors on Tick Eradication at Shreveport, La., May 18, 1918.

tick is gone. Boil down the facts and present them in a simple, unbiased way. Gain the man's confidence, friendship and respect, but do not fight him.

If there is no hope of converting the objector to your way, then proceed in a businesslike manner to apply the forces of the law at your command without unnecessary fuss. Have your evidence clear and clean-cut; don't go off half-cocked and wonder why you didn't get a verdict. You must bear in mind you are a stranger in a strange land, that the man on trial is among his boyhood friends and that you, yourself, must stand well in the community before you can hope for success. The inspector's personal deportment in the community often has a great deal to do with the outcome of cases brought before a jury.

Inspectors sometimes unthinkingly make indiscreet remarks in conversations which are carried to all parts of the country like a wireless message. I know of a case where an inspector inadvertently made a remark in a certain county where everything was going well up to that time, but after that it was Sherman's application to war.

Nothing great was ever achieved without enthusiasm. A successful inspector must be enthusiastic, he must be level-headed, he must be energetic. The things that usually hold back tick eradication are the indifferent local inspector (the lazy man), the incompetent local inspector (too old for any use), and the skeptical owner (the "personal liberty" man).

What is this personal liberty? It is the benighted idea of some anti-dippers who have a total disregard for law and order and consider that their "personal rights" should be the law of the land and not what the statutes provide. Such a person is commonly termed a knocker, who always imagines himself a crowd, and is usually found at meetings to ask such questions as "What's good for hollow horn?"

The answer to the personal rights man is that he has not only rights but plain duties to perform as well, and that the right sort of a man will pay more attention to his duties than he does to his rights.

I remember while making a trip in Marion County, Miss., I laid special stress on cooperation and copartnership in tick eradication. One very old gray-haired citizen opposed to dipping got up and said: "That reminds me of the story of two men who went into co-

partnership on a day's hunt. They were to divide what they got that day. Well, all they killed was a turkey and a buzzard. So, when the dividing time came, they argued about who should have the turkey, but you know, in the end, someone got that buzzard, and that's the way this tick eradication is going to turn out."

It was up to me to say something, so I said: "You didn't say who got the buzzard in your story, but I'll tell you in my story that the tick has been getting the turkey for years, and there's plenty of evidence that the buzzard is always hovering around the house of the cattle owner that harbors ticks."

Every inspector is a necessary cog in the wheel to the success of tick eradication—he may do much to mar the work, and he may be a powerful help in its prosecution. The greatest success of an inspector depends largely on the ability he shows in prosecuting the work and "handling the people". If he knows his business, there need be no fear of his gaining the confidence of the cattle owners, and thus his work will be considerably lightened.

CLINICAL AND CASE REPORTS

REPORTS OF CASES OF HEMORRHAGIC SEPTICEMIA*

W. S. FERRAND

I have been asked to report two or three experiences with hemorrhagic septicemia which I have had in the last year and a half.

CASE NO. 1. A bunch of steers a year and a half to two years old were shipped from Kansas City, and on arrival two of them were noted to have a bloody diarrhea with quite a high temperature. No positive diagnosis being made the owner did nothing for a few days until one or two of his cows showed symptoms, and one cow suddenly died. I called Dr. L. E. Willey from Ames in consultation. Dr. Willey came that evening, we made a post mortem examination, and upon microscopic examination found the hemorrhagic septicemia organism. Vaccination was advised and serum secured from Iowa State College. We took the temperatures of all the cattle and found four or five running quite high. Serum was used for those

*Presented at the 30th Annual Meeting of the Iowa Veterinary Association, Iowa State College, Ames, Iowa, January, 1918.

running a high temperature, and vaccine for those which were apparently healthy. None were lost after treatment. Three animals had been lost before treatment.

CASE NO. 2. Sixty head of steers were shipped from St. Paul, originating somewhere in Canada. They were on the road quite a number of days before arrival here and whether they were infected through the stockyards at St. Paul or elsewhere I do not know. Upon arrival three showed a lagging gait and a little diarrhea. These three cases were running quite a high temperature, with labored breathing. Two of them had quite a diarrhea, one showed no diarrhea, but had a bloody discharge in the feces. I telephoned for serum and used serum on the three that were running a high temperature. The rest of the herd was treated with vaccine, with no further losses.

CASE NO. 3. A herd consisting of 60 calves was shipped from Kansas City. They were unloaded, one was sick, and another had to be hauled home. The owner let them go about two days. Upon being called I made a diagnosis of hemorrhagic septicemia and immediately secured serum and vaccine from the college. When I took the temperature four or five of them were running a temperature, but showed no other clinical symptoms. These were given serum and the remainder the vaccine. They all came through in nice shape.

DISCUSSION

DR. W. A. HECK: I have not had a great deal of experience with hemorrhagic septicemia, but have had a few cases in cattle coming out of Omaha and Kansas City stock yards and shipped to our section of the country. I have had excellent results in the treatment of hemorrhagic septicemia with the bacterins furnished by the biological manufacturers. I have never used any of the serum. I have also had good results from the use of bacterins in cases in which the disease was considerably advanced. In these cases I administered the bacterins several days apart, say once a week, and the animals recovered. I do not know whether or not I would have had better results with the serum.

I have had some cases in horses which I thought were septicemia, and I had some correspondence with and sent some specimens to Dr. Chas. Murray of Ames and he verified the diagnosis. He was not sure it was the primary cause of the disease, but thought it was probably secondary. The lesions found on post mortem examination were characteristic, and the microscope verified the diagnosis.

In one case an insurance company had insisted, before paying the loss, that a post mortem examination be made to ascertain the

cause of death. Post mortem examination disclosed hemorrhagic septicemia. I sent a specimen to Dr. Chas. Murray for examination, and the diagnosis was confirmed.

DR. W. S. FERRAND: I would like to ask any of the members whether they have seen hemorrhagic septicemia in hogs. This fall I was called to see some hogs which were shipped in vaccinated. Thirty days after vaccination two hogs in one herd died suddenly, and I was called to make a post mortem examination. These hogs had been eating regularly and were apparently in good health but on going out to look at them in the afternoon two were found dead. On post mortem examination I found hemorrhages all through the intestines and in practically all the organs. I would like to know whether any of the members have found hemorrhagic septicemia in hogs.

DR. F. A. HINES: I would like to ask Dr. Ferrand if he found any lesions in the lungs.

DR. W. S. FERRAND: We did not find any marked lesions of the lungs.

DR. H. B. TREMAN: I would like to hear from Dr. Chas. Murray or from any other member in regard to the length of immunity that is conferred by the use of bacterins in hemorrhagic septicemia.

DR. CHAS. MURRAY: The immunity is of short duration. We have had cases of recurrence of the disease twelve to fifteen days after treatment where we had no reason to believe that infection existed in these animals at the time of treatment. In experimental animals immunity will hold as long as seven months. We have immunized rabbits with the simultaneous treatment, giving a live culture and protecting this with serum at the same time, and conferred immunity for seven months, and then used them in the ordinary course of work in the laboratory; in cattle the immunity is apparently of short duration.

DR. W. P. BOSSENBERGER: In speaking of hemorrhagic septicemia in hogs, we have had considerable to deal with in our neighborhood, and I have tried various methods of treatment. I have tried hog cholera anti-serum upon them and it did not give any results. I tried various antiseptic medicines, and they did not give any result. A bunch of hogs, immunized in the summer, came down with severe hemorrhagic enteritis. I gave these hogs a dose of serum and rectal injections of normal salt solution, with two drams of iodine to the quart. They seemed to improve for two or three weeks, then began to get worse.

I had some literature on the subject of bacterins in hemorrhagic septicemia in hogs, and thought I would try them out. I sent for some of these bacterins and tried them. Most of the hogs recovered.

I may say also that in hogs, among the various lesions found was an ulcerated condition of the bowels, sometimes just a necrotic sort of pus lesion, and scrapings from these ulcers when examined

were found to contain many bacteria. They can be demonstrated in the blood in acute cases. In most of these cases where they died suddenly I found myocarditis. I have used serum in horses and bacterins in cattle and in hogs and have had good results in the number of animals I have treated.

DR. G. P. STATTER: Will some one discuss the possibility of transmitting infection to hogs devouring cattle that have died from hemorrhagic septicemia?

DR. H. B. TREMAN: I might cite an experience I was unfortunate enough to have with hemorrhagic septicemia. The client had lost several head of cattle before a diagnosis was made. The symptoms were so unusual that we were very slow in making a diagnosis. Four or five dead cattle were eaten by the hogs, with no bad results whatever. I know of several other cases where the first animal that died was eaten by hogs. I have knowledge of no case where there was transmission of the infection.

In order to make a positive diagnosis in this outbreak, after consulting several veterinarians, we called Dr. L. E. Willey from Iowa State College. He made a microscopic examination and confirmed our diagnosis. I ordered bacterins which were given; the man had lost about 12 head, but did not lose any more following the use of the bacterins. Since that time I have had 14 or 15 different cases of hemorrhagic septicemia, and in most cases have used the bacterins with very good results. There have been some cases where there has been the loss of one or two or three animals after the administration of the bacterin. I recall one case in which one animal died a week or ten days afterwards. During the period of two years of observation of this number of cases the disease has not recurred on the same farm except in one case, and that was just a week ago Friday. I was called back to the place where they had the disease last summer and had shipped in some cattle from Sioux City recently, or sometime during the winter, and have had a recurrence of the disease at that place. The first animal that died was one of those that were shipped in, and the next two were from those that had had the vaccine about six months before, so that it is apparent that the immunity was not carried longer than six months in that case. Outside of that, immunity has either been carried or they have not been reinfected. But in most cases young calves have come into the place since then without any trouble at all.

There is another point to which I desire to call attention. It seems rather curious to me and interesting in a way, and that is the fact in some cases the infection is quite virulent, and is transmitted rapidly from one animal to another in the same herd, but I have had no evidence of the disease apparently traveling from one farm to another. I have known one or two other cases, where the disease apparently was so well marked as to leave no doubt about the diagnosis, and of three animals sick in the herd one died. Yet nothing was done whatever, and no additional deaths occurred.

A MEMBER: When you give the bacterins, do you give more than one dose?

DR. H. B. TREMAN: I never have. I would say, however, I believe that if sick animals could have repeated doses of the bacterins at two to five day intervals, they would have a marked curative effect. I have treated a few cases medicinally which have recovered either from the treatment or in spite of it, I don't know which. I really believe that repeated doses of bacterins are indicated where it is convenient to give them.

DR. W. P. BOSSENERGER: I find that to be the case in hogs. Hogs do not respond to less than two treatments, and often it is necessary to give the treatments from three to five days apart. In cattle I have given but one dose and they seemed to do very well. In hogs I find it necessary to give three or four doses.

DR. F. J. NEIMAN: I would like to ask Dr. Treman how long these cattle with hemorrhagic septicemia lived.

DR. H. B. TREMAN: Some of them lived 30 minutes, and others lived four or five days. Some of them apparently were sick for a week or ten days and got well.

DR. F. J. NEIMAN: I have not had any die in less than 30 to 46 hours.

DR. H. B. TREMAN: In 14 or 15 different herds I have seen hemorrhagic septicemia, and I believe that many different clinical symptoms are manifested. Sometimes there will be two or three symptoms shown in different animals in the same herd, but I do not hesitate to say that I have seen at least a dozen different clinical symptoms manifested in animals with this disease. There was one case that was especially interesting to me. I was called to see a young steer in a fair condition. He had been running on clover and the owner found him down about 6 o'clock in the evening. He had not been down very long. He showed evidence of brain lesions, being partially comatose at times, and again excitable, although paralyzed and unable to get up. He soon died. I had made a diagnosis of hemorrhagic septicemia before he died. On post mortem after careful observation I found absolutely nothing abnormal except the kidneys. They were normal in size and appearance, but showed blotches the size of the finger nail. There were no small petechial hemorrhages, but those brownish spots, hardly black, but a little bit darker than the normal appearance of the kidney. I simply did not know what it was. I didn't feel after we posted this animal that the condition looked like hemorrhagic septicemia, so I didn't advise the vaccination of the other animals. I sent a specimen to the laboratory for examination and bipolar staining organisms were found, and while the specimen was not in good condition the lesions were reported those of septicemia. There were a few evidences of putrefaction, but there were quite a number of bipolar staining organisms

of the septicemic type found. The client did not lose any more and there was nothing done.

DR. J. D. CLINE: I quite agree with Dr. Treman when he says that hemorrhagic septicemia is a very peculiar disease, and I believe we are just beginning to learn a little about it.

I have had cases this year which I have diagnosed as hemorrhagic septicemia in cattle, and I believe we have hemorrhagic septicemia in horses. Before this time I have had some cases that died without any diagnosis.

As to vaccination and the results from it in cattle, I am still at a loss to know how much benefit is derived from vaccines. I have treated herds of cattle with the vaccine and also with the serum, and have had apparently good results. I remember one case where a man had lost a steer and a diagnosis of hemorrhagic septicemia was made. I advised vaccination. However, this man waited and no more of the animals became sick. Some animals recover without any treatment at all, with no more loss in the herd and when we compare those that have not been treated with the cases we had treated, I would like to know why we have a right to say the vaccines have been beneficial. We have apparently the same results with or without treatment. However, I want to say that after vaccination I have never had a loss in a herd. I have had the acute and chronic types of hemorrhagic septicemia to deal with. I believe this disease comes in very many different forms, and I also feel that it is a disease secondary in its nature. I do not believe that hemorrhagic septicemia in itself is a very deadly or fatal disease in the primary form, but I believe the disease comes on in secondary form. For instance, in most of my cases the cattle were shipped in, and I take it, were weakened by being in a different climate. In some cases, it is possibly due to the feed they are getting. In the cases I have had where a diagnosis of hemorrhagic septicemia was made there was gastro-enteritis as a symptom of the disease.

I differ with the gentleman who states that there is no benefit from the use of serum in hogs. I have never had a case in hogs that did not apparently show better results after serum was given. I am a little doubtful in my mind if in these cases there was not hog cholera mixed up with hemorrhagic septicemia. Hog cholera is becoming a more complex problem all the time. I am at a loss to know whether bacterins are beneficial or not, but with the results I have had I feel that they are beneficial, and I have only given one treatment. I have never had any loss after treatment, and have had recovery in herds without any treatment at all. I am in the dark about hemorrhagic septicemia and the use of vaccines.

DR. CHAS. MURRAY: I would like to ask Dr. Cline what he means by hemorrhagic septicemia not being a primary infection, when speaking of the predisposing causes of bad housing, change of climate, etc.

DR. J. D. CLINE: I believe the shipping, change of climate, etc., weaken the animals so that infection sets in. It may really be the cause of the disease. At any rate, there is that weakened condition of the animals. We all know that we carry the pneumonia organism in our lungs, but we are not infected with pneumonia until we become devitalized. That is what I had in mind. In all cases I have had there seems to have been some cause back of the disease. As to hogs shipped in, I do not know. I have had no case where hogs infected with this disease were raised in the locality. I have had it in both cattle and hogs that were shipped in. In native animals I do not think I have had cases except in one or two animals which were probably first affected with some gastroenteritis or some condition where the tissues were devitalized, and that is why I speak of it as a secondary infection more than a primary cause. I may be wrong. I am bringing that point out for discussion.

DR. W. P. BOSSENERGER: In the last three years I could cite a dozen outbreaks of hemorrhagic septicemia in cattle fed low, and in them the disease may have been secondary rather than primary.

DR. J. D. CLINE: Any animal that is fed low is out of the ordinary condition.

DR. W. E. MACKLIN: In most of the cases I have seen, the outbreaks of the disease were in cattle that were shipped in. I received the report of an outbreak in October. In an hour's time one cow was dead. The owner looked over his herd and found another one that was isolated from the herd. Within the course of two hours this animal went down, struggled and died. An autopsy was made and we sent to Ames for vaccine, and vaccinated the rest the next day. The next day a neighbor lost two animals as suddenly with the same symptoms. The following day, three miles east, there were two deaths in another herd. No cattle had been shipped into that community. They were right out on the blue grass pasture. Post mortem examination disclosed no evidence of any other infection than hemorrhagic septicemia. We could find no other condition in the animals that would be predisposing to the disease. Ten days after the first herd was vaccinated a pure bred bull about three years old died.

DR. L. A. WHITE: About two years ago I had an outbreak of hemorrhagic septicemia. The owner had lost one calf, and after a second one died he decided it was time to find out what was wrong. I made a post mortem examination on this animal and found typical lesions of hemorrhagic septicemia. I secured vaccine from Ames to treat the herd. Two in the herd were sick at the time, but there were no further fatalities. Since then I have had experience with twelve or fifteen different outbreaks of hemorrhagic septicemia, with no more than one loss on the place. I have advised vaccinating in each case, but for various reasons, financial being the principal one, vaccination was not resorted to, and no further losses occurred.

The carcasses of these animals in 50 per cent of the cases were fed to the hogs.

This fall I had an interesting case. The client called me out on Monday, after having lost two calves, and had one more sick. When I arrived at the place I found that he had dragged the carcasses of the dead animals into the hog lot, and they were frozen. All the organs I was able to tell anything about were the lungs and heart. The lesions in the lungs and heart were not sufficient to pronounce the disease hemorrhagic septicemia, although I told him my suspicions. In the meantime, I do not know whether he had lost confidence in my ability or not, however, he called in another veterinarian. We went out the next day and found that the calf sick the day previous had died. We posted the calf and found the typical lesions of hemorrhagic septicemia. I at once sent to Kansas City for vaccine. It was delayed in arriving. I think it arrived on Friday. I went out to the place to vaccinate and by that time the man had changed his mind. The two that were sick had recovered. He thought there was little or no virtue in vaccination. We did not vaccinate, and he has had no further fatalities. The hogs did not get sick, and the two animals that were sick recovered.

A MEMBER: I would like to ask Dr. Murray if he finds the same organism in cattle, hogs and sheep, and whether the lesions are the same.

DR. CHAS. MURRAY: Experimentally we have never been able to have the disease transmitted from one species of animal to another. We do have reports of septicemia, chicken cholera, hemorrhagic septicemia in cattle and maybe of sheep on the same farm, but there is no connection between the causative organism in one class of animals and another. I hesitate to say what I am about to say because I always recommend that carcasses of animals be disposed of otherwise than by feeding; but last fall there were 37 head of cattle that died from hemorrhagic septicemia in one herd. All of these were fed to hogs and no bad results from feeding ensued. We never have succeeded in producing hemorrhagic septicemia in pigs experimentally by feeding the carcasses of cattle that died of hemorrhagic septicemia. I am strongly of the belief that the disease is not readily transmissible.

A MEMBER: If animals are exposed and have been weakened in any way previously I can readily see how that may have something to do with susceptibility to infection. Most of these herds before being exposed may have been weakened physically. As to being a secondary infection, hemorrhagic septicemia may be a secondary infection, but it may be a primary infection as well.

DR. J. W. GRIFFITH: I have seen hemorrhagic septicemia in all forms, last summer in particular. I have often wondered if we are justified in using serums and vaccines in this disease. In some cases where I have telegraphed for it and have not gotten it in time, the

animals have apparently got along without it. I am of the opinion that we are imposing an unnecessary expense on the farmer. I have seen deaths after the use of the serum, and I have seen them live where it was not used. So I raise the question, are we warranted in using serum and vaccine in these cases?

DR. D. H. MILLER: I have noticed this disease for many years. We used to call it cornstalk disease. I have found more of it in cattle that were shipped in. A client near Council Bluffs called me last fall stating that he had lost a steer out of a herd of 40 or 50 two-year-olds that he had shipped in the week before. I made a diagnosis of hemorrhagic septicemia and advised vaccination, but he didn't think he would have it done. The following morning he had two or three more dead. He said that I had better get some vaccine. I sent to Kansas City for vaccines and the next morning was ready to do the work. I went out and found three more dead and another one ready to die. The evening before we had looked at the cattle quite late and everything seemed to be favorable. The animals appeared to be in perfect health. I used the vaccines and he did not have any more deaths. I have wondered since whether the vaccines did the business or whether the animals recovered in spite of their use. I have had that occur many a time before.

DR. K. W. STOUDEUR: I had an outbreak the past fall, the man having lost seven head. These cattle were all in the same field. In a half dozen acres or so there were about 40 cattle, 90 head of hogs and 15 or 20 horses. They were fed one hayrack load of green fodder a day. They changed the feed and surroundings and there was no more loss. The cattle were eaten by the hogs, with no deaths of the hogs, and nothing more was heard from them until this winter. They telephoned me the other day saying they had lost one more and wanted advice. I told them to change them around the same as they did the other time. This was done, and there has been no further loss.

DR. S. K. HAZLETT: I have come to the conclusion that it is not an easy matter to differentiate between hog cholera and hemorrhagic septicemia. My experience has not been as extensive as that of many others. I wish to relate one case I had where a man that owned a farm in Minnesota shipped cattle into St. Paul, sold a number of them, the others being tested for tuberculosis and shipped to a farm in Iowa. Two animals had died when I was called and there were four more sick. I made a diagnosis of hemorrhagic septicemia, procured serum as quick as I could and treated them. There were six deaths altogether. The treatment given the sick ones was eumenthol with sulphocarbolate internally. Some of the very sick ones recovered, and some of them did not. This treatment was very satisfactory to me and to the owner. If there are any other outbreaks in his immediate vicinity, I am quite satisfied they will call for vaccination. Here was another peculiar thing in this case: the cow that

first died was one that was shipped in, and the other five that died were those on the farm. None of the others that were shipped in died. That is rather peculiar.

We have been talking about feeding these carcasses to hogs. I do not advise feeding these carcasses to hogs, but the point was mentioned in regard to whether the carcass could be cooked. I can see no objections to the farmer cooking this meat and feeding it to his hogs. This was done with the last one that died. Some of the animals were buried. The two first ones that died were buried, and the rest were cooked and fed to hogs.

I think we should discuss the question whether or not these carcasses should be fed to hogs as this question the veterinarian must decide. As a rule, I do not advise it. However, I can see no objection if the carcasses are cooked.

I have heard no one say whether or not hides from these animals are given any treatment before being shipped. It seems to me, it is a proper thing to disinfect the hides before they are shipped.

DR. ORR: I have noticed that some outbreaks of hemorrhagic septicemia are quite virulent and believe there is some predisposing factor as a rule. I do not believe the disease is contagious in the same sense that hog cholera is. We do find in some of these cases a mixed infection. I think shipped in cattle are more predisposed to the disease than cattle under normal conditions. Cattle under normal conditions do not usually contract the disease.

DR. L. E. WILLEY: I would like to ask an explanation of this fact. Assuming cattle have been shipped in and are placed on a farm with cattle or calves that are perfectly normal as far as one is able to tell and running in pasture, and you have the appearance of the disease in the shipped in cattle, why then do you so often have loss in the domestic cattle which have not been weakened or predisposed through shipment?

DR. F. J. NEIMAN: One thing seems extraordinary to me regarding hemorrhagic septicemia in cattle that are shipped in. My experience has not been similar to that of some of the preceding speakers. I have never seen hemorrhagic septicemia develop in cattle recently shipped in. It has happened with us among the cattle raised in the locality, that have been there for a long time. We get cattle from Kansas City and Sioux City, but I have yet to see the first case of hemorrhagic septicemia in cattle that have been shipped in.

DR. W. S. FERRAND: In the first case I cited, the man had a herd of 40 head of steers shipped in. One was sick when the herd arrived, and the second case that developed was one of his own best milch cows, and both died. The steer that was sick on arrival died several days afterward.

Another point I want to bring out is this: I would like to ask any of the veterinarians present if they have ever used serum on the

sick ones and vaccine on the well ones. I attribute my success to this practice. In every case where I find animals showing infection or clinical symptoms I have used serum, and vaccines on the well ones.

DR. J. D. CLINE: I would like to ask some one who is engaged in research work whether these organisms are found in the system of animals that have died of some other disease. It may become pathogenic from some cause. Is it normally found in the tissue? May not a great many cases we call hemorrhagic septicemia be some other disease? I believe we call many cases hemorrhagic septicemia when they are something else. I believe on microscopic examination the organism that causes hemorrhagic septicemia might possibly be found in the tissue of an animal dead of some other disease, and if anybody doing research work can answer that question, I would like to have them do so.

DR. CHAS. MURRAY: It is a common thing for the hemorrhagic septicemia organism to be a secondary invader. There are predisposing factors to disease, and there are primary and real causes of disease. Predisposing factors are important in putting the animal into a physical condition where the microorganisms are sufficiently virulent to produce disease.

As to the question of finding organisms in healthy animals, it is commonly known that they are found in healthy animals, particularly in the nasal discharge. They are commonly found in the intestinal tract.

DR. S. A. DEMING: I wish to relate a little experience I had sometime ago. I believe I have learned to be guarded in my prognosis and my advice to my clients. About a year ago a client called and said one of his steers was crazy and wanted to know what the trouble was. The steer was dead when I arrived. I found in the dead steer what I thought were unmistakable evidences of hemorrhagic septicemia, and I told him what I considered the condition to be. He said his steers were ready for the market and he intended to ship them out Saturday. I agreed with him that this was the thing to do as my experience had been up to that time that when one died several would die. I said he was liable in a few days to lose a dozen or more of his steers. He said he was going to ship them Saturday, but failed to get his cars. The steers stayed in the yard two weeks, and there was no more septicemia, and he closed the incident by informing me that he thought I was a poor one from whom to seek advice. Perhaps some of the younger veterinarians will be a little more careful in offering a prognosis in hemorrhagic septicemia.

TEAT OPERATIONS*

THOS. H. FERGUSON, Lake Geneva, Wis.

The teat operations I am going to describe are a few simple operations that I have used for a long time in my practice with satisfactory results. My clients are satisfied with them, as indicated by their repeated calls for these operations. I will first take obstructions of the end of the teat, caused by injuries, frost bite, infection, etc., most commonly found in cows kept in the old fashioned wooden stanchion which favors injuries by treads, etc., from the adjacent cows much more than does the modern stanchion with pipe partitions.

The history of these cases are much alike. The owner or herdsman informs you that they were all right at the last milking, but milked with difficulty or not at all from the affected teat the next milking. Upon examination we find a hard swollen condition of the teat end with or without a wound or wounds. The quarter may be relieved of its milk by using a teat tube but these cases will terminate unfavorably if the use of the teat tube is persisted in. I have never yet found anyone able to lay down a rule whereby the layman could use a teat tube twice daily, for any length of time, without disastrous results to the quarter. The ordinary man considers a teat or tube clean if he is unable to see any dirt on them. I formerly used hard rubber teat bougies, or metal teat plugs, to dilate the affected duct, with unfavorable results; in fact, I have tried every apparently sane way of handling this condition, with very poor success until I began doing the operation I am about to describe.

It is absolutely essential in doing teat and udder operations to have the animal well restrained. First the teat is well cleaned, especially at the orifice, it is then dipped in etherized iodine. I carefully introduce a sterile teat bistoury, with the blade guarded into the orifice and up past the obstruction which is the inflamed swollen circular muscle that forms the valve. I then engage the cutting point of the blade to the superior or upper side of the muscle and put on enough pressure to divide the muscle, being careful not to punch through the skin or cut the mucous membrane at the

*Fifty-fourth Annual Meeting of the A. V. M. A. Clinic, Kansas City, Mo., August, 1917.

orifice of the teat. Repeat the procedure until the muscle has been divided three or four times at equal distances. The milk usually runs out in a stream until the quarter is one-fourth relieved when it is then necessary to empty the gland by milking. The after treatment consists of dipping the teat before and after milking in a 1/1000 solution of mercuric chloride and the milker's hands should be clean and dipped in the same solution before milking or handling the teat.

The next operation is for the fibrous growths that obstruct the duct of the teat, anywhere from the upper part of the lower third to the gland usually found at the upper part of the middle third. If a teat bistoury or curette is used on these cases the immediate results are good but in from three to ten days the trouble recurs. I find the best way to handle obstructions of this kind is to prepare the teat by washing with soap and water, rinsing with 1/1000 solution of mercuric chloride, dip in etherized iodine, inject a few drops of a 5% solution of cocaine into the field of incision; roll a rubber band up to the base of the teat to prevent bleeding, tense the teat by stretching, then with a sterile sharp scalpel make an incision down on to the fibrous growth, dilate the wound and dissect the growth out with a blunt pointed pair of scissors, apply etherized iodine to the wound. Leave the rubber band on two hours, then remove by cutting with scissors so as to not molest the wound.

AFTER TREATMENT. Apply etherized iodine and antiseptic powder twice daily for three days, then once daily. The milk will leak out sufficient to relieve the gland the first few days, then it will be necessary to strip it out by hand, with precautions against infecting the wound. If the wound does not become seriously infected this operation gives satisfactory results and will save a good many teat quarters that would be lost to other treatment.

Complete stenosis of the milk duct may occasionally be cured by slitting it completely from the base to and through the muscular valve at the apex of the teat, being careful not to cut through the mucous membrane at the orifice. Four incisions, equal distance apart, through its entire length are necessary.

Atresia of first calf heifers may be relieved in the same way after perforating the entire length of the teat with a large sterile probe. This condition is usually caused by being sucked by other calves while a calf.

In cases of severe wounds or other injuries to the teat ends,

when the parts are beyond repair, complete ablation of the affected part is indicated and it is surprising how well some of these cases will terminate, providing the cow is on a good flow of milk when the operation is performed.

Blocking of the teat duct, with casein or blood clots, is best relieved by manipulation with the fingers. Every country practitioner should practice such manipulation until they become expert at it and by so doing save a good many teats and quarters.

Fistula of the teat is best operated when the cow is dry, preferably a month or more preceding parturition. Some object to castrating a cow heavy with calf, but I have had no bad results from doing so.

The field of operation must be thoroughly cleansed with soap and water, thoroughly soaked in a 1/500 solution of mercuric chloride and the whole teat painted with tr. of iodine. The instruments, scalpel, tissue forceps, artery forceps, teat tube, scissors, needles, suturing material, sterilized by thorough boiling. Inject a few drops of 5% solution of cocaine into the field of incision and around the fistulous tract; introduce a long sterile, self-retaining teat tube into the teat, leaving it there for a guide, apply a clean rubber band to the base of the teat to prevent bleeding, grasp the fistulous tract with a pair of forceps and completely isolate it by an elliptical incision on each side of it down to the duct, make a clean dissection, removing all the skin leading down to the duct, then suture, using the mattress stitch, do all the operating and handling of the teat with sterile instruments, apply etherized iodine and collodion. If the operation has been done surgically clean the wound will heal by first intention and the teat will be o. k. when the cow freshens.

Removing supernumerary teats to improve the appearance of the udder is best done in heifers or when the cow is dry. Use the same restraint, remove the teat or teats close to the udder with a pair of sterile sharp scissors and cauterize the duct and wound with the small point of a thermo cautery at cherry red heat. No after treatment is necessary.

—Dr. J. E. Shillinger has removed to Little Rock, Ark., and will have charge of tick eradication in Miller County, Ark.

—Dr. James W. Murdoch has removed from Bismarck, N. D., to Omaha, Neb.

—Dr. Stephen L. Blount, Fort Worth, Texas, has been assigned to duty at National Stock Yards, Ill.

THE RELIEF OF LAMENESS*

L. G. W. HART, Chippewa Falls, Wis.

This paper is relative to the operation for relief of lameness in case of side-bones only.

HISTORY OF THE OPERATION. This operation was first brought to my notice in 1886 or 1887 when I was a student with James Hart, M.R.C.V.S., at that time in practice at Oldham, England. Since my agreement to write this paper, I have endeavored to obtain all available information, relative to this operation, which I find rather limited. I have, through the kindness of Professor Joseph Hughes, been able to ascertain that this or a similar operation first came to his notice some twenty-five years or so ago. A description at that time appeared in some of the London veterinary magazines, recommended by Fred Smith of Bombay.

The description of the operation as given by Dr. Hughes is as follows: the quarter showing the side-bones is grooved from the coronary to the plantar border. The cutting through the horny wall extends through the dark crust lying over the layer, care being taken not to produce bleeding. The deeper part of the groove is then incised by a scalpel, so as to insure a separation of the area of horn, which it is intended to loosen. Having done this the grooves made through the wall are connected by cutting through the white line between the sole and the wall, a portion of the lower border of the detached portion is cut away, so that it may not reach the ground. The foot is now encased in a cotton pack, which is kept steadily saturated for several days. Following this, if any lameness is present, it is advised that a blister be applied at the seat of the side-bone.

The operation seems to have been lost sight of in America, at least, as near as I can find out, it has not been practiced to any extent in this country.

I will now describe the operation as performed by myself:

First clean the foot and surrounding area thoroughly and saturate the parts with a 1/500 solution of bichloride solution. Now, cocaine with a 4 or 5% solution of cocaine over the metacarpal

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nerves. There are three important factors to take into consideration in doing this operation.

FIRST. Do not cut or injure the coronary band.

SECOND. Always make your cuts or incisions transverse to the fibres of the horny wall or crust, extending from the coronary to plantar border.

THIRD. Be sure to cut completely through the horny wall, leaving the section free.

I take the ordinary foot knife or gauge, and first groove out the horny wall at the superior part just inferior to the coronary band. These grooves are $\frac{3}{8}$ of an inch wide and $\frac{1}{2}$ to $\frac{3}{4}$ of an inch in length, and extend through the horny wall to the sensitive lamina. Beginning at a point where the side-bone is most prominent exteriorly or where the greatest tension is manifested on the coronary band, make two such grooves, the second midway between this part and the termination of the quarter of the hoof. I now take an ordinary stiff bladed saw, which has previously been rounded off in front, being sure there is plenty of set in the saw to allow free cutting. I now start my cuts at the plantar surface of the wall, make a few strokes with the saw to give same a foothold at this point; gradually raise the heel of the saw, to allow the rounded front end to cut its way down into the grooves. I have never exercised any particular precaution in not wounding the sensitive lamina. It looks to me as though it would be almost an impossibility to do this operation without bleeding. When the cutting is completed I insert some blunt instrument into the incisions, rotate same, to satisfy myself the sections are free. I now insert two small wedges in each cut; a method adopted by myself, which may or may not be exercised. I leave same in for 24 hours to further insure complete separation of the sections. I have performed this operation during the past 20 years or so, whenever opportunity presented itself, with the very best of results, almost always putting the horse to work the following day. I have not made a practice of bandaging the foot but can see where same would be good treatment in some localities or under some conditions. Until the last few years I have not even used anti-tetanic serum. An operating table is indispensable.

AZOTURIA*

E. E. DOOLING, Syracuse, N. Y.

The reason I take Azoturia as a subject for my paper is because I have always been more or less of a crank on the subject; especially in regard to the drawing of the urine. During the month of April I had seven cases in six days so I was busy for a time. The first one was a gray horse, weight about 1550 pounds, that went down on the pavement. It was raining and he rolled around for about an hour before the ambulance came. From his general appearance I did not think he had any chance to live, so I thought I would experiment with him. I gave him two doses of sedatives but they did not do much good. I gave him $1\frac{1}{2}$ pints of raw oil with $6\frac{3}{4}$ of turpentine and after we got him home I left another $1\frac{1}{2}$ pints of oil and $6\frac{3}{4}$ of turpentine to be given every three hours, making 8 doses out of the one bottle. I continued the same treatment and nothing else for four days. He had $1\frac{1}{2}$ pints of turpentine and 3 quarts of oil. I tried, after 48 hours, with the slings to see if he would stand but he could not. After 90 hours down he was able to stand with the help of the slings and the following day was able to get up and down alone. From his general appearance when I first saw him, I surely thought this horse would die. I did not draw his urine then, nor did I draw it at any time. Is it necessary that we should draw the urine in azoturia, unless it is done for the effect on our client, not the patient? After 4 days I used soda bicarbonate in tablespoonful doses, 3 doses in 24 hours. I fully realized that the doses of the turpentine were large. I had the experiment in mind for some time and when the opportunity presented itself I tried it and it was successful. I treated the six other cases in the same way and did not draw the urine in any case but one and that was for effect on the client.

*Presented at the meeting of the Central New York Veterinary Medical Association, Syracuse, N. Y., June, 1917.

—Dr. A. J. Dinse has removed from Hamilton to Moultrie, Ga.

—Dr. T. S. Hickman has removed from Kansas City, Mo., to N. Charleston, S. C.

ABSTRACTS FROM RECENT LITERATURE

THE PROPERTIES OF THE SERUM OF ANIMALS HYPERIMMUNIZED AGAINST GLANDERS, AND THE CHOICE OF ANIMALS FOR THE PREPARATION OF SUCH SERUM RICH IN SUITABLE ANTIBODIES. Bertetti, E., and Fuizi, G. *Atti della Reale Accademia dei Lincei, Rendiconti, Classe di scienze fisiche, matematiche e naturali*, Series 5, Vol. XXV, Part 5, pp. 131-135, Rome, September, 1917. Abstract in *Internat. Rev. of the Science and Practice of Agriculture*.—The writers have attempted to prepare anti-glanders sera rich in antibodies by using the following animals: the *ass*, which is very susceptible to glanders, and when infected naturally or experimentally, usually suffers from the acute form of the disease; the *mule*, in which the disease is usually very acute (though acute cases are fairly common in that animal and chronic cases are not rare); the *horse*, in which the disease is usually chronic; the *ox*, which is naturally quite immune.

The experiments were as follows:

Immunizing by using bacilli killed by chemical means. On August 30, 1916, a horse received an intravenous injection of a 7- to 8-day, half-culture on agar of glanders bacilli killed with a solution of bichloride of mercury. The following injections were made in decreasing doses: at the 12th injection 5 agar cultures were inoculated. The first injections were given close together; afterwards they were given every 5 days up to the end of January, 1917, when they were given every 12 or 13 days.

Immunity obtained by using bacilli killed by heat. On August 28, 1916, a horse, mule and an ass were treated like the horse mentioned above, with the difference that the bacilli were killed by heat.

Immunity obtained by means of bacilli killed by heat and by a malleinic toxin. Two horses and an ass were treated with bacilli killed by heat and by malleinic toxin obtained by a special process.

Immunity conferred on cattle by means of bacilli killed by heat and virulent bacilli. Two oxen were immunized subcutaneously; the first received injections of very virulent bacilli grown on agar; the second received cultures from the same stock, but killed by heat (1 to 6 abundant cultures in Petri dishes). The injections were made regularly every 5 days for about 8 months. The oxen supported the immunizing treatment very well.

RESULTS. In August, 1917, the subjects under treatment yielded serum having the following specific qualities: very energetic

precipitating power; *agglutinating* power very manifest, even at considerable dilutions, *e. g.*, of 1:10,000 to 1:20,000 (the heat test showed the specific nature of the agglutinins of these sera, in showing that they were such as would confer immunity); this serum has abundance of a specific *sensitizing* agent, easily recognizable either in presence of *Bacillus mallei*, or in presence of different bacillary extracts.

The animals under treatment did not all yield a serum of equal activity. Those inoculated with broth or agar cultures of *Bacillus mallei* and with mallein gave quite inactive serum.

If the *precipitating*, *agglutinating* and *sensitizing* powers of the various sera obtained are classed by means of numbers from one to ten, the following scale is obtained: serum from oxen, 10; serum from horses, 8; serum from mules, 4; serum from asses, 1 to 2. The power of fixing alexins, precipitating malleinic poisons and agglutinating the various races of *B. mallei* is perfectly proportional for all the sera.

CONCLUSIONS. 1. It is possible to obtain from the different animals (ox, horse, mule, ass) anti-glanders sera with strong precipitating powers in regard to various malleins and cultures of the bacillus obtained by filtration, of high agglutinating power and containing specific sensitizing agents, easily recognizable in presence of the causal organism or its various extracts. 2. The existence of a more or less great individual disposition to glanders has an inversely proportional effect in the production of anti-glanders antibodies. In fact, these antibodies, which show the work performed by the organism in order to acquire immunity, are more abundant in ox-serum and diminish progressively through the horse, mule and ass. 3. According to the writers, the fact that oxen are immune to the disease should not be considered as being related to the lack of affinity between *B. mallei* and the cellular units of the organism, as these latter are certainly and actively affected by *B. mallei*. 4. It is inadvisable to treat the animals with agar or broth cultures of the glanders virus together with mallein, with the intention of producing a *complete* serum, for the soluble products of *B. mallei* contained in suspension in the broth cultures, or the crude mallein injected, possibly being modified only slowly, finally neutralize *in vivo* the antibodies produced by the bodies of the organisms, or else the haptophoric group of the precipitin absorbs and fixes the precipitin. 5. The precipitins contained in the anti-glanders sera prepared by

the writers are thermolabile: temperatures between 55° and 60° C. destroy the functional, precipitogenous, and acting group of the precipitins, which are changed into precipitoids.

The work was carried out in the "Glanders Research Laboratory" of the 3rd Italian Army. The writers place their anti-glanders sera at the disposal of other workers. FISH.

MALE FERN EXTRACT FOR DISTOMIASIS. In the *Spanish Veterinary Review* for April, 1916, Dr. Maximilien Gonzales of Leon, Spain, reports excellent results from the use of five grams of ethereal extract of male fern mixed with 25 grams oil of almonds in the treatment of distomiasis in sheep. This dose was given in the morning on an empty stomach and repeated daily for four days. In some cases the medicine was administered through a stomach tube, but it was found more satisfactory to give it from a bottle with the usual precautions. The mixture should be thoroughly agitated before giving.

We believe this treatment was first introduced by Prof. Perroncito who demonstrated that male fern extract would kill most of the flukes, but he reported that there was serious tympanitis and anesthesia. Dr. Gonzales does not mention these conditions, but says that a number of sheep died during the treatment, but attributes death to the advanced state of the disease, as the sheep were not strong enough to stand the treatment. In one flock of ninety sheep, seventeen died by the time the third dose had been given. The treatment was discontinued and the remainder of the animals made a fine recovery. Dr. Gonzales concludes: first, that the cachexia in sheep, due to distomata, can be combated with male fern extract at all stages; second, the loss from treatment is directly in proportion to the advanced stages of the disease. N. S. M.

PYOTHERAPY IN THE TREATMENT OF HARNESS WOUNDS; SOME CONSIDERATIONS ON THE EFFICACY AND ABSOLUTE NON-SPECIFICITY OF ANTICRYPTOCOCCAL PYOTHERAPY ON THE HORSE. H. Velu. *Bulletin de la Société de Pathologie Exotique*, I, Vol. X, No. 10, pp. 901-903, Paris, December, 1917; II, Vol. XI, No. 1, pp. 12-17, Paris, January, 1918. Abstract in *Internat. Rev. Science and Practice of Agriculture*.—I. In the course of researches on the pyotherapy of epizootic lymphangitis the author has repeatedly found how efficacious is treatment with polyvalent vaccines (either anticryptococcal

vaccine, or vaccine prepared from ordinary suppurations) for curing *non-specific* lesions, caused by harness.

During the negative phases, the periperal inflammatory reaction becomes intense; the separation furrow forms more quickly; the necrosis tissue is eliminated more easily, on account of the increased suppuration; surgical intervention becomes more easy, and the wound clears up without useless decay. During the positive phases, the wound cicatrizes almost without suppuration, with surprising regularity and quickness.

The author states that he has, by means of pyotherapy, rapidly cured arthritis and a severe traumatic synovitis, as well as obstinate bony fistulae. Lignières (Baeteriotherapy in the treatment of wounds, *Bulletin de la Société Centrale de Médecine Veterinaire*, 1915, pp. 544-548) has already pointed out that specific organisms are not the only ones that give good results when injected into sick subjects. An anti-anthrax vaccination may stay the spread, in a herd, of a disease in no way connected with anthrax; wounds that won't heal may do so after injection of an organism unconnected with the disease, such as *B. coli*. On the other hand it is well known the injection of any antigen is followed by a hyperleucocytosis.

In conclusion, pyovaccine provides a very efficacious, simple and economic method within the reach of all practitioners, for reducing, in considerable proportions, the time lost in laying up for harness wounds.

II. The polyvalent antieryptococcal pyovaccine prepared at the Casablanca Laboratory has been used for treating pyogenous lesions of the horse due to pathogenic agents other than the cryptococcus. The results clearly showed the definite action of the pyovaccine.

In every case, the injections brought about decreased local inflammations, less pain, the diminution, then disappearance, of suppuration, and in certain cases, sterilization of the lesions. Their non-specific effect is undoubted, even when they do not bring about complete recovery.

The author quotes work of other experimenters on other vaccines, showing their non-specific action, and he concludes, speaking generally, that polyvalent, para-specific pyotherapy is a very simple and economical method which, whether by results already obtained, or those rightly expected, should take a prominent place in the practice of veterinary therapeutics.

FISH.

OAK POISONING OF LIVESTOCK. C. Dwight Marsh, A. B. Clawson and Hadleigh Marsh. Bureau of Animal Industry, United States Department of Agriculture.—The species *Quercus gambellii* in Utah and the shinnery oak or *Quercus havardi* in Texas and New Mexico are said to be the cause of oak poisoning in cattle. Sheep poisoning is unconfirmed. Horses are not reported to have been poisoned. The trouble occurs when cattle are driven to the summer range and there is little grass for them to eat. They do not eat the oak by preference.

The annual loss in the shinnery country is estimated at three per cent. Few of the cattle seem to suffer from their oak diet. If a small quantity of hay is fed daily no harm results from the oak. Under such conditions oak may be considered good forage.

There is extreme constipation. Feces are passed infrequently, are dark and hard, sometimes largely mucus, sometimes bloody. Constipation may be followed by diarrhea. External symptoms are gauntness, rough coat, nose dry and cracked, and head extended forward. There is extreme weakness with loss of appetite. Temperature and respiration are normal. The symptoms are noticed after feeding on the oak for about a week. Death may occur in two weeks or after an indefinite period.

Treatment consists of overcoming the constipation, keeping the cattle away from the ranges until the grass has a start, or seeing that the diet is not entirely oak. Three pounds of alfalfa hay daily with the oak will furnish a maintenance diet for a 2-year-old steer.

HAYDEN.

TUBERCULOSIS IN CAMELS, IN EGYPT. F. E. Mason. *The Agricultural Journal of Egypt*, Vol. VII, pp. 6-11, Plates, Cairo, 1917. Abstract in *Internat. Rev. Science and Practice of Agriculture*.—Tuberculosis appears rarely to affect camels outside Egypt, but in that country it has long been known. In 1911, 1.63% of the camels slaughtered at the Cairo abattoir were found to be tuberculous, while for 1915 the percentage was 5.4. These figures are certainly higher than those for the entire infection in Egypt.

The author ascertained the cause of the disease by identifying the causal bacillus, controlled by inoculations in guinea pigs. The bacillus appears to be of the bovine type.

The author thinks that infection takes place primarily from cattle, the method being by inhalation. About 60% of the tubercu-

lous camels are only affected in the lungs, bronchial and mediastinal glands. The disease is never found in camels from countries where they do not come in contact with cattle. The subcutaneous test with ordinary tuberculin can be successfully employed on suspected camels.

FISH.

ARMY VETERINARY SERVICE

VETERINARY FORCE SUFFICIENT TO MEET ALL ARMY NEEDS NOW

The War Department has authorized the following statement from the office of the Surgeon General:

Examinations for commissions in the Veterinary Corps have been closed. There is available a force sufficient to meet all requirements of the Army for some time to come. In addition to the 1,700 officers and 10,000 enlisted men on active duty there is a waiting list of men who have passed the examinations and who will receive commissions when vacancies occur. As soon as the waiting list is exhausted a new examination will be held. Due notice will be published.

Veterinary graduates called under the selective service act will be taken into the service as privates. After a few months of service they will be allowed to take the examinations for veterinary officers. Should they pass, they will be given commissions as soon as practicable. Men over the draft age and under 40 years may enlist as privates and will have an equal chance with the selected men for commissions.

A training school for commissioned veterinary officers on active duty has been established at Camp Greenleaf, Chickamauga Park, Ga. One hundred men are graduated every month after having received a special two months' course.—*Official Bulletin*, June 27.

The meat inspection service of the Veterinary Corps has expanded with the growth of the Army since the outbreak of the war. All meats and meat products purchased by the Depot Quartermaster in Chicago and the subsidiary depots in other large cities are carefully inspected for compliance with specifications. This covers practically all the refrigerated beef, canned meats, ham and bacon, which are sent to the overseas forces or issued to troops in this coun-

try. Veterinary meat inspectors remain in the packing houses and observe the processing from the selection of the meat to the sealing of the cans in which it is packed. Every step in the process receives a critical scrutiny in order that the Government may secure only meat from sound animals which has been properly prepared and preserved for transportation and issue.

The service in Chicago is supervised by Major George A. Lytle, V. C., N. A., assisted by 43 veterinary officers who are trained meat inspectors and 25 enlisted men. Meat inspectors who have been properly trained under the regulations of the Bureau of Animal Industry are the only ones engaged in this work and some difficulty is encountered in securing enough men for the enlisted force in particular. These enlisted men are not veterinary graduates but must have had at least one year's experience with packing house methods. Men of this class who are subject to the selective draft or who wish to enlist should communicate with the Surgeon General of the Army stating their qualifications.

A veterinary officer is attached to each division as meat inspector and to each cantonment is allowed a division or camp meat inspector with two enlisted assistants. Officers and men selected for this work are sent to Chicago for the course of instruction before assignment to stations.

—Majors D. S. White and R. J. Stanclift have received the rank of Lieutenant-Colonel. These gentlemen have been engaged in important administrative work since last autumn. Their many friends in the profession congratulate them on their promotion.

—Captain T. S. Hickman has removed from Kansas City, Mo., to the Animal Embarkation Depot, North Charleston, S. C.

—Lieut. G. L. Richards has been transferred from Camp Doniphan, Okla., to the American Expeditionary Forces, France.

—Lieut. L. J. Anderson has removed from Placerville, Calif., to 115th Field Signal Battalion, Camp Kearney, Calif.

—Lieut. L. N. Peterson has been transferred from Tallahassee, Fla., to the Animal Embarkation Depot, North Charleston, S. C.

—Lieut. Jesse L. Shabram of Hartford, S. D., is now stationed at Camp Greenleaf, Chicamauga Park, Ga.

—Captain G. A. Jarman has been transferred from the Remount Service, Kansas City, Mo., to the Medical Officers' Training Camp, Camp Greenleaf, Fort Oglethorpe, Ga.

—Lieut. A. A. Goodman, formerly at Falfurrias, Texas, has been transferred to Fort Bliss, El Paso, Texas.

—Lieut. S. K. Andreassen, formerly at Barnesville, Minn., is now stationed at Camp Lewis, American Lake, Wash.

—Lieut. Frederick Low has been transferred from Camp Dodge, Ia., to Camp Lee, Va.

—Dr. J. Hanrahan, formerly at Highwood, Mont., is now stationed at Camp Lewis, Wash.

—Dr. J. J. Kelly, formerly at Marshall, Minn., is now stationed at Fort Oglethorpe, Ga.

—Dr. H. E. Torgersen, formerly at Camp Cody, N. M., is now stationed at Camp Greenleaf, Chickamauga Park, Ga.

—Dr. Maurice C. Hall of the Research Laboratories of Parke, Davis & Co. of Detroit, Mich., has received a commission as Second Lieutenant in the Veterinary Corps, and has been ordered to Fort Oglethorpe for duty.

—Lieut. Harve Frank, formerly at El Paso, Texas, is now stationed at Camp Funston, Kans.

—The marriage of Miss Edna Keeler and First Lieut. J. F. Jansen occurred at Ithaca, June 29. Lieut. Jansen has been stationed at Camp Beauregard, La., but has now been transferred to Chicago.

—Dr. W. R. McCall, formerly of Oklahoma City, Okla., is now with the 144th Field Artillery, Camp Kearney, Calif.

—Dr. R. T. Renwald, formerly at So. Omaha, Neb., is now stationed at Camp Lee, Va.

—Lieut. W. C. McConnell, formerly at Holdenville, Okla., is now stationed at Camp Greenleaf, Chickamauga Park, Ga.

—Lieut. C. J. Cook has been transferred from Camp Cody, N. M., to Chicago, Ill.

—Lieut. H. C. Pugh, formerly at Camp Devens, Mass., is with the American Expeditionary Forces.

—Major F. T. G. Hobday, formerly on the Flanders front, is now with the British Expeditionary Forces in Italy.

—Lieut. T. E. Wilke, formerly of Chicago, Ill., is with the Detroit Refrigerating Co., Detroit, Mich.

—Lieut. F. J. Reamsnyder, formerly of Elmhurst, N. Y., is stationed at Chicago, Ill.

—Lieut. R. O. Stott has been transferred from Fort Bliss, Texas, to 12th Cavalry, Columbus, N. M.

AMERICAN VETERINARY MEDICAL ASSOCIATION

THE A. V. M. A. MEETING, PHILADELPHIA,
AUGUST 19 TO 22, 1918

Arrangements have been practically completed for the 55th convention of the American Veterinary Medical Association which will be held at Philadelphia, August 19 to 22.

The local committees and officers of the association are much pleased with the interest manifested by members in all parts of the United States and Canada. A new feature of interest is the prominence which has been given this year's convention by the publications devoted to stock breeding and farming. A number of prominent breeders have signified their intention of attending the sessions for the purpose of establishing closer relationship with the veterinary profession. There seems to have been a general awakening to the necessity for conserving and promoting livestock interests to meet the demands of war and to anticipate the famine conditions for restocking which will occur after the war is over. The inquiries thus far received indicate a record breaking attendance and the local committees are making every effort to provide a program replete with instructive and entertaining features. A tentative program, which is appended, has been assembled but is expected to be considerably enlarged dependent upon cooperation of Government Officials and Army Officers.

It is a matter of regret that special rates of travel could not be obtained, but it is suggested that persons coming from a distance purchase tickets to Atlantic City or other seashore resorts with stop-off privilege at Philadelphia.

The ladies' auxiliary of the entertainment committee has provided features which will keep their guests happy and contented, and leave pleasant memories of the 55th convention.

The headquarters of the convention will be at the Bellevue-Stratford Hotel where all sessions, except the clinic, will be held. The entire second floor of the hotel has been placed at the disposal of the association and there will be no confusion in locating the particular session in which one may be interested.

The Bellevue-Stratford is conveniently located at Broad and Walnut Streets in the heart of the city, being three blocks from Broad Street Station of the Pennsylvania Railroad and four blocks from the Terminal Station of the Philadelphia and Reading Railway.

The clinic on Thursday morning will be held at the Veterinary School of the University of Pennsylvania, 39th Street and Woodland Avenue.

Every member of the association should make special efforts to attend this annual meeting as matters of vital importance to the profession will be presented. Members of the veterinary profession who are not members of the association are cordially invited to attend and present their applications for membership.

PROGRAM*

MONDAY, AUGUST 19, 1918

9:30 A. M.

Meeting Called to Order by the President in the Ball Room.

Invocation.

Star Spangled Banner—one verse.

Canadian Anthem—one verse.

French Anthem—one verse.

Address of Welcome—Hon. E. T. Cattell for the Mayor of Philadelphia.

Response to the Address of Welcome—V. A. Moore.

President's Address.

Presentation and Adoption of Minutes of Last Meeting.

Report of Executive Board.

Secretary's Report.

Treasurer's Report.

Report of Committees.

1:30 P. M.

SECTION ON GENERAL PRACTICE

(Junior Cotillion Room)

Chairman's Address—T. H. Ferguson, Lake Geneva, Wis.

Secretary's Report.

LITERARY PROGRAM

The Chloramine Antiseptics and Disinfectants (Illustrated)—N. S. Mayo, Chicago.

Swine Practice—C. Courtney McLain, Meadville, Pa.

Certain Aspects of the Pathology of Spavin (Illustrated) S. A. Goldberg, Ithaca, N. Y.

Differential Diagnosis of the Diseases of the Pig—W. W. Dimock, Iowa State College.

Some Surgical Operations in Swine—T. H. Ferguson, Lake Geneva, Wis.

Election of Section Officers.

1:30 P. M. (Ball Room)

SECTION ON SANITARY SCIENCE AND POLICE

Chairman's Address—J. G. Wills, Albany, N. Y.

Secretary's Report—H. Preston Hoskins, Detroit, Mich.

Practical Methods of Prophylaxis Against Worm Infestations—B. H. Ransom, Zoologist, B. A. I., Washington, D. C.

Practical Methods of Treatment for Worm Infestations—M. C. Hall, 2d Lieut., V. O. R. C., Detroit, Mich.

Discussion of Papers on Parasites—E. L. Quitman, Chicago, and W. Horace Hoskins, New York.

Avian Tuberculosis in Swine—L. Enos Day, Chicago.

Practical Methods of Treatment and Prophylaxis for Arthropod Infestations—Seymour Hadwen, Pathologist, Dept. Agr., Ottawa, Canada.

Election of Section Officers.

*Subject to revision.

MONDAY, AUGUST 19, 1918

1:30 P. M. (Reed Room)

SECTION OF VETERINARY COLLEGES AND EXAMINING BOARDS

President's Address—M. Jacob, Nashville, Tenn.

Report of Secretary—C. D. Wall, Des Moines, Ia.

The Trend of Veterinary Education—W. Horace Hoskins, New York City.

Veterinary College Investigation—E. A. A. Grange, Toronto, Ontario.

The Extension Veterinarian—Geo. M. Potter, Manhattan, Kans.

Fraternity—J. W. Sallade, Auburn, Pa.

Requirements for Enlistments for Veterinary Students in the Enlisted Medical Reserve Corps—Capt. F. C. Waite, Sanitary Corps, N. A., Office of Surgeon General, Washington, D. C.

Animal Husbandry and Its Importance in a Modern Veterinary Course—H. H. Havner, State College, Pa.

Standardization and Cooperation of State Veterinary Medical Examining Boards—D. E. Westmoreland, Owensboro, Ky.

Election of Section Officers.

MONDAY, AUGUST 19, 1918

8:00 P. M.

President's Reception.

TUESDAY, AUGUST 20, 1918

9:30 A. M. (Ball Room)

WAR SESSION

Army Veterinary Matters—Major John P. Turner, V. C., N. A., Washington.

Bureau of Animal Industry as a War Auxiliary—John R. Mohler, Chief B. A. I., Washington, D. C.

Obscure Lameness and Some of Its Causes—George H. Berns, Brooklyn, N. Y. *Veterinary Corps*

National Army Abroad—Major Louis A. Klein, Washington, D. C.

Veterinary Education—A. H. Baker, Chicago.

Discussion led by D. M. Campbell, Chicago, Ill.

TUESDAY, AUGUST 20, 1918

1:30 P. M. (Ball Room)

Miscellaneous Papers

The Veterinary Practitioner and the Control of Infectious Diseases—V. A. Moore, N. Y. State Veterinary College.

The Livestock Industry; Present and Prospective—J. J. Ferguson, Chicago, Ill. Business.

Election of Officers.

TUESDAY, AUGUST 20, 1918

7:00 P. M.

Alumni and Class Meetings.

WEDNESDAY, AUGUST 21, 1918

9:30 A. M. (Ball Room)

JOINT SESSION

Hog Cholera in the East—Edward A. Cahill, Indianapolis, Ind. Formerly Director of Hog Cholera Control, Mass. Department of Animal Industry.

Tuberculosis Eradication—John A. Kiernan, B. A. I., Washington, D. C.

Standardization of Blackleg Vaccine—L. W. Goss, K. S. A. C., Manhattan, Kas.

Some Investigations on Sheep Diseases in Colorado—Geo. H. Glover, I. E. Newsum, and E. W. Alkire, Ft. Collins, Colo.

The Hog in Relation to Municipal Garbage—C. B. Palmer, Easton, Pa.

Subject Not Announced—E. L. Quitman, Chicago, Ill.

WEDNESDAY, AUGUST 21, 1918

1:30 P. M. (Ball Room)

JOINT SESSION

Symposium on Contagious Diseases

A Preliminary Report on the Value of Blood Tests in the Control of Contagious Abortion of Cattle—C. P. Fitch and W. A. Billings, University Farm, St. Paul, Minn.

The Bang Virus and Its Relation to Endo-metritis, Metritis, Abortion and Sterility—John F. DeVine, Goshen, N. Y.

Suggestions for Legal and Regulatory Measures Against Bovine Infectious Abortion—Ward Giltner, Mich. Agri. College, E. Lansing, Mich.

Discussion of Papers on Contagious Abortion—E. T. Hallman, Mich. Agri. College, E. Lansing, Mich.

TUESDAY, AUGUST 20, 1918

10:00 A. M.—Sight Seeing Auto Trip.

1:30 P. M.

2:30 P. M.—Theatre Party.

8:00 P. M.—Card Party.

10:00 A. M.—Auto Trip to Valley Forge.

1:30 P. M.

2:30 P. M.—Shopping Tour.

8:00 P. M.—Banquet at Bellevue-Stratford.

THURSDAY, AUGUST 22, 1918

9:30 A. M. (Ball Room)

BUSINESS SESSION

Stallion Enrollment—C. D. McGilvray, Winnipeg, Ont.

Subject Not Announced—Wm. M. Bell, Nashville, Tenn.

Hypertrophy of the Septum nasi of Horses and Mules—R. C. Moore, St. Joseph, Missouri.

THURSDAY, AUGUST 22, 1918

1:30 P. M.

Clinic, University of Pennsylvania Veterinary Department, 39th and Woodland Ave.

Visit to H. K. Mulford's at Glenolden.

3:30 P. M.

Boat Ride on Delaware River to Hog Island.

SOCIAL PROGRAM

(Mrs. H. B. Cox, Chairman)

MONDAY, AUGUST 19, 1918

10:00 A. M. (Ball Room)

Opening Exercises.

1:30 P. M.—Luncheon.

2:30 P. M.—Meeting Ladies' Auxiliary American Veterinary Association.

Opening Prayer—Mrs. F. H. Schneider, Philadelphia.

Address of Welcome—Mrs. H. B. Cox, Philadelphia.

President's Report—Mrs. W. H. Hoskins, New York City.

Reading and Adoption of Minutes of Previous Meeting.

Reports of Various State Secretaries.

Unfinished Business.

New Business.

Adjournment.

8:00 P. M.—President's Reception (Ball Room).

THURSDAY, AUGUST 22, 1918

10:00 A. M.—Visit to Girard College.

1:30 P. M.—Visit to H. K. Mulford Laboratories at Glenolden, Pa.

2:30 P. M.—Boat Ride on the Delaware River to Hog Island Ship Yards.

HOTELS FOR THE A. V. M. A. MEETING

| Hotels | Address | Distance from Headquarters | Rates | | | |
|-------------------------------------|---------|----------------------------------|------------------------|---------------------------|------------------------|---------------------------|
| | | | Single With Bath | Single Without Bath | Double With Bath | Double Without Bath |
| Adelphia—13th and Chestnut | | 2 blocks | \$3.00 | | \$5.00 | |
| Aldine—19th and Chestnut | | 6 blocks | 3.00 up | \$1.50 up | 4.00 up | \$2.50 up |
| Bellevue-Stratford—Broad and Walnut | | Headquarters | 3.50 up | 2.50 | 5.00 up | 4.00 up |
| Bingham—11th and Market | | 5 blocks | 2.50 up | 1.50 up | 4.00 up | 3.00 up |
| Colonnade—15th and Chestnut | | 2 blocks | 2.50 up | 2.00 | 4.50 up | 3.50 up |
| Continental—9th and Chestnut | | 6 blocks | 2.00 | 1.50 | 3.00 | 2.50 |
| Dooner's—10th above Chestnut | | 5 blocks | 1.50 and 2.00 | 1.00 and 1.50 | 2.50 and 4.00 | 1.50 and 2.00 |
| Green's—8th and Chestnut | | 7 blocks | 2.50 | 2.00 | 3.50 and 4.00 | 2.00 up |
| Hanover—12th and Arch | | 5 blocks | 2.00 up | 1.50 up | 3.00 up | 2.50 up |
| Stenton—Broad and Spruce | | 1 block | 3.00 | 2.00 | 5.00 | 4.00 |
| Vendig—13th and Filbert | | 4 blocks | 2.50 shower | | 4.00 shower | |
| Walton—Broad and Locust | | 1 block | 2.50 | 2.00 | 3.50 | 3.00 |
| Keystone—1528 Market St. | | 3 blocks | 1.50 | 1.00 | 2.50 | 2.00 |
| Little Wilnot—1410 S. Penn Sqr. | | 1½ blocks | 1.50 | 1.25 | 3.00 | 2.50 |
| St. James—13th and Walnut | | 1 block | 3.00 | 2.50 | 4.00 | 3.50 |
| Ritz-Carlton—Broad and Walnut | | Opp. Headq'r's | 5.00 | | 7.00 | |
| AMERICAN PLAN | | | | | | |
| Aldine—19th and Chestnut | | 6 blocks | 6.00 | 5.00 | 11.00 | 9.00 |
| Windermere—224 S. Broad St. | | ½ block | 3.00 up | | | |

“AN ADVANCING PROFESSION”*

“Veterinarians are as essential to an army as surgeons are. They are preventing equine epidemics, saving the lame, wounded or over worked horses, keeping the army transport service in condition to feed the men and supply them with means of defense. The profession of veterinary medicine is justly recognized in modern armies as of equal importance with other professions. In civil life the profession is gaining by a clearer understanding of its usefulness as well as by the high standard which it has set for itself, a standard not below that of any other profession. When the world needs food and when a large part of its animal population has had to go to slaughter on account of war, it is of the utmost importance that epidemics be prevented and that all possible animals be saved for food or the work necessary to produce food. A profession with such notable achievements to its credit as the eradication of foot-and-mouth disease, the steady but sure reduction of Texas fever areas, the control of hog cholera and other epidemic diseases is entitled to the respect of stockmen and of the country. Everywhere relations between veterinarians and farmers are becoming closer as these things are better understood. The veterinarians are doing their part toward a better understanding of the aims, purposes and approved practices of their profession. For instance we are now asked to extend to all stockmen an invitation to attend and participate in the discussions of the American Veterinary Medical Association, which meets at Philadelphia, August 19th-23d. We cheerfully do it for the good of all concerned. Let us welcome the passing of the quack, a progress of veterinary science and the general appreciation of it.”

*Extracted from the *National Stockman and Farmer*, Pittsburgh, issue of June 29, 1918.

—At the meeting of the Illinois Veterinary Medical Association, July 9-11, at Urbana, a resolution was offered urging the legislature to make an appropriation to establish a veterinary college under the control of the State University for the training of veterinarians, not only in medicine and surgery, but along all lines that shall promote, develop and protect the livestock industry of the State.

ASSOCIATION MEETINGS

TIPPECANOE VETERINARY MEDICAL ASSOCIATION

The Tippecanoe Veterinary Medical Association held its bi-monthly meeting Wednesday, June 12th, commencing at 2 o'clock, at the Veterinary Building of Purdue University. The association had the pleasure and privilege of listening to Doctor J. E. Gibson and Doctor Clark H. Hays, government inspectors in charge of animal disease control in Indiana, and also Doctor L. E. Northrup, State Veterinarian, who favored us with a timely talk on vaccination of stock hogs to be returned to farms for feeding purposes.

Doctor J. E. Gibson explained the method by which the government hopes to be able to build many accredited tubercular free herds in the various states in which they are operating. Doctor Gibson eliminated many false notions in the minds of the practicing veterinarians relative to the government interfering with their business. He asked for their cooperation and showed the future possibilities by such team work.

Doctor Northrup pointed out in his talk how pork has been increased in Indiana by returning feeding hogs to Indiana farms from the public stock yards after vaccination. The past year's work has been very gratifying. Out of fifty thousand head of hogs shipped out of one public stock yard only one break was reported.

Doctor Clark H. Hays emphasized the necessity of cooperation by all forces within the State in order to do effective work.

An evening program was arranged at one of the local hotels. Dinner was served at 6 o'clock with thirty-five present. After dinner Mr. E. J. Llewelyn from New Castle, Ind., representing the State Council of Defense, gave a forceful and instructive talk on "The Danger Within". He pointed out the additional service the veterinary profession could render to the country at this particular time by refuting German propaganda that is being constantly floated over the country that would do unlimited harm in the remote districts unless some one counteracted such statements and give such communities real facts. Mr. Llewelyn stated that he could always count on a meeting of this kind bringing forth good results.

The election of officers for the ensuing year took place with the following result:

Honorary president, Lieut. R. B. Whitesell (France); president, Dr. G. M. Funkhouser; vice president, Dr. J. E. Kixmiller; secretary-treasurer, Dr. L. C. Kigin.

U. S. BUREAU OF ANIMAL INDUSTRY VETERINARY ASSOCIATION, BUFFALO, N. Y.

At a meeting of Bureau of Animal Industry veterinarians held in Buffalo, N. Y., Thursday evening, June 20th, the U. S. Bureau of Animal Industry Veterinary Association was organized. The meeting was called by Dr. E. T. Faulder, who has advocated such a move for some time. The meeting was well attended; every veterinarian becoming a member. The objects of the association are to affiliate with the American Veterinary Medical Association, advance the interests of the Bureau veterinarians and make the Service more attractive.

The following officers were elected: Dr. J. M. Chase, president; Dr. W. C. Wooton, vice president; Dr. E. T. Faulder, secretary; Dr. E. R. Jackson, treasurer.

CENTRAL NEW YORK VETERINARY MEDICAL ASSOCIATION

The ninth annual meeting of the Central New York Veterinary Medical Association, held in Syracuse on Thursday, June 27th, 1918, opened at 10:00 a. m., with a clinic at the infirmary of Dr. H. A. Turner, now located at 1238 South State Street. The following cases were presented:

1. Spaying of cat; Dr. E. E. Dooling's case; surgeons: Dr. H. J. Milks and Dr. Dooling.
2. Bay gelding; quittor; Dr. J. A. Pendergast's case; surgeons: Dr. J. N. Frost and Dr. Pendergast.
3. Bay gelding; quittor; Dr. E. E. Dooling's case; surgeons: Dr. Frost, Dr. Dooling and Dr. H. A. Turner.
4. Gray gelding; roarer; Dr. H. A. Turner's case; surgeons: Dr. Frost and Dr. Turner.
5. Gray gelding; quittor; Dr. J. A. Pendergast's case; surgeons: Dr. J. A. Pendergast and Dr. W. M. Pendergast.
6. Demonstration of use of violet rays in case of mange on gray mare, by Dr. W. L. Clark.
7. Gray mare; quittor; Dr. W. M. Pendergast's case; surgeons: Dr. J. A. Pendergast and Dr. W. M. Pendergast.

8. Black gelding; quitter; Dr. E. E. Dooling's case; surgeons: Dr. J. M. Currie and Dr. Dooling.

The business session was opened at the St. Cloud Hotel at 2:30 p. m., with the following present: active members, Dr. H. A. Turner, Dr. W. B. Switzer, Dr. F. E. York, Dr. J. A. Pendergast, Dr. J. M. Currie, Dr. E. E. Cole, Dr. E. E. Dooling, Dr. Wilson Huff, Dr. Frank Morrow, Dr. W. L. Clark, Dr. C. R. Baldwin, Dr. W. M. Pendergast, Dr. R. C. Hurlbert, Dr. A. H. Ide, Dr. J. C. Stevens, Dr. J. V. Townsend, Dr. J. K. Bosshart, Dr. M. W. Sullivan, Dr. A. L. Danforth, Dr. O. P. Jones, Dr. J. H. Stack; honorary member Dr. V. A. Moore; guests, Dr. P. A. Fish, Dr. Otto Faust, Dr. J. N. Frost, Dr. H. J. Milks, Dr. O. B. Webber, Prof. Asmus.

Dr. W. M. Long of Baldwinsville was elected to active membership in the association and Dr. Otto Faust of Poughkeepsie to honorary membership. Dr. J. H. Stack was elected censor to succeed Dr. W. L. Clark. Dr. J. M. Currie was elected president; Dr. W. L. Clark, vice president; and Dr. W. B. Switzer, secretary and treasurer, all for the ensuing year.

A very interesting and profitable program of addresses and papers was furnished by members, as follows:

Address by Dr. W. M. Pendergast, retiring president.

Address by Dr. J. M. Currie, president.

Paper: Azoturia—My Late Experience With It—Dr. E. E. Dooling.

Paper: The Use of Violet Rays in Practice—Dr. W. L. Clark.

Address: The Veterinary Practitioner and the War—Dr. V. A. Moore.

Paper: Some Facts About the Tuberculin Test—Dr. W. M. Pendergast.

Paper: Report of Experience in Treatment of Sheep—Dr. J. C. Stevens.

The subjects presented called forth thorough discussion.

Adjournment was taken at 6:30 p. m., which closed one of the best meetings yet held.

The society has always been particularly fortunate in its friendships outside of the membership. At this meeting no less than five members of the faculty of the State College at Ithaca, in addition to Dr. Moore, Dean of that school, who is an honorary member, were present and their interest is appreciated.

W. B. SWITZER, Secretary.

CAMP DODGE VETERINARY ASSOCIATION, MAY 28, 1918

Meeting called to order at 6:45 p. m., by the president, Major Gould.

As there was no new or unfinished business the program was opened.

Lieut. Leon M. Getz presented an excellent paper on Army Horseshoeing.

After being discussed by Lieuts. Mosher, Tillie and Major Gould, the rest of the members took Lieut. Getz in hand and quizzed him upon various phases of shoeing, the normal foot and of the treatment and proper mode of shoeing to remedy the various pathological conditions found in the foot.

Major Gould illustrated his method of treating contracted heels.

Lieut. Lester L. Jones presented a paper on Lice Among Army Animals, which was discussed by Lieuts. Smith, Parrish and Dawson.

Motion made and seconded to hold the next meeting Tuesday, June 4th, 1918, carried.

Motion to adjourn carried.

June 4, 1918.

Meeting called to order at 6:45 p. m., by the president, Major Gould. Sixteen members present.

Lieut. George Moon presented a paper on Army Horse Boards. This was ably discussed by Captain Edward J. O'Harra, Lieuts. MacNamara, Middleton, Underwood and Major Gould.

Lieut. J. F. Derivan delivered an excellent paper on Army Meat Inspection. It was discussed by Lieuts. Moon, Mosher, Moye, Elson and Smith.

Motion made and seconded to hold the next meeting Tuesday, June 11th, 1918; carried.

Motion to adjourn carried.

June 11, 1918.

Meeting called to order at 6:45 p. m., by the president, Major Gould.

Minutes of previous meetings read and accepted.

Paper presented by Lieut. R. G. Moore upon Cryptorchids and Their Castration. Discussed by Lieuts. Moon and Tesdell and other members of the association.

Captain Edward J. O'Harra presented a paper upon the Remount Depot, dealing with its personnel, purpose, etc. It was discussed by Lieuts. Moore and Nelson.

Motion to hold the next meeting Tuesday, June 18th, 1918, carried.

Motion to adjourn carried.

June 18, 1918.

Meeting called to order at 6:45 by the president. Minutes of the previous meeting read and approved.

Lieut. Wilbur Smith read an excellent paper upon Influenza, Its Complications and Treatment. It was discussed by Lieuts. Nelson, Moore and Dawson. A good many points in regard to the treatment, prevention, complications, etc., were brought out in the discussion.

Lieut. Underwood read a paper upon Swelling and Stocking of Legs; Cause and Treatment. The causes of this condition being so numerous it brought out a very good discussion which was led by Lieuts. Middleton, Tillie and MacNamara. Some rather pertinent suggestions in regard to chronic conditions of this kind were brought out in this discussion.

Motion to adjourn carried.

LIEUT. ROBERT C. MOORE, Secretary.

WESTERN NEW YORK VETERINARY MEDICAL ASSOCIATION

The Western New York Veterinary Medical Association held its fifth annual meeting Friday, June 28th, at Buffalo, N. Y.

The meeting opened with a clinic which consisted of cases for observation, diagnosis and operation on both large and small animals.

At the business session which followed the following officers were elected for the ensuing year:

President, Dr. J. L. Wilder, Akron, N. Y.; vice president, Dr. W. E. Frink, Batavia, N. Y.; secretary-treasurer, Dr. F. F. Fehr, Buffalo, N. Y.

From 6:30 to 8 p. m., a banquet was held at the Teck Cafe, after which the meeting reconvened at the S. P. C. A. Hall, where the addresses and papers were given.

Dean W. Horace Hoskins of New York City addressed the association on the timely topic of conservation and preservation of

food, and pointed out among numerous other things the great waste that was going on while thousands upon thousands were slowly starving.

Dr. C. E. Gibbs of Fredonia gave an interesting paper on Hog Cholera and Mixed Infection in Garbage Fed Hogs.

Dr. Geo. R. Chase of Attica read a very practical paper on Dystocia in Cattle, citing numerous cases he has met in daily work.

The association voted the sum of twenty-five dollars to the Red Star Animal Relief, through the local director of the S. P. C. A., Mr. Preston.

Meeting then adjourned to the second week in December, 1918.

At a recent meeting of the Western New York Veterinary Medical Association the following resolutions were recommended and adopted:

WHEREAS, The present great need for more food products in our country is becoming more apparent and pressing each day; and

WHEREAS, We as veterinarians are brought in close contact with the breeders of livestock and the producers of dairy products; therefore, be it

Resolved, That as a society of veterinarians and as individual practitioners we use our influence among breeders and dairymen to take better care of their stock and encourage the breeding and raising of more food and milk producing animals; and, be it further

Resolved, That the price of milk as fixed by the Federal Food Administrator to the producer and to the distributor be more evenly divided, the latter selling his supply at 48 cents per gallon whereas the producer is only allowed 19 cents per gallon, thereby permitting an excess profit by the middleman. Such acts do not tend to stimulate increased production; and, be it further

Resolved, That the number of food producing animals is not large enough to provide for the needs of our people and leave a surplus to be shipped to our allies, thereby necessitating frequent "meatless days"; and

WHEREAS, The cost to the consumer of pork, beef and mutton is almost prohibitive, resulting in under-nourishment to the families of the poor; and

WHEREAS, The flesh of equine animals furnishes a wholesome nourishing substitute and would be largely used in the place of other meats if made available; therefore, be it

Resolved, That the Western New York Veterinary Medical Association in convention assembled advocate the use of horse meat as a substitute for beef and respectfully asks that an appropriation be made by Congress to provide for the Federal inspection of horses for food and that the sale of horse meat be legalized under proper restrictions; and, be it further

Resolved, that each practitioner take it upon himself while at his regular work to encourage such increase of food and food production; and, be it further

Resolved, That we pledge ourselves to cooperate in similar lines of work offered by the local Farm Bureaus, Grangers, State and National Authorities; and be it further

Resolved, That copies of these resolutions be sent to the Federal and State Food Administrators and to the veterinary journals.

Signed, J. L. Wilder, Edw. Rafter, Anderson Crowforth, E. L. Volgenau.

F. F. FEHR, Secretary.

COMMUNICATIONS

BRITISH APPRECIATION OF DR. LIAUTARD

Editor Journal of the American Veterinary Medical Association, Ithaca, N. Y.:

DEAR SIR:

Dr. Liautard's death will be much felt by members of the Veterinary profession in every part of the world, as he was indeed the Father of the Profession. I am publishing his photograph in the next issue of the VETERINARY JOURNAL, together with a biography which does not, however, express one-half of the esteem in which I and all my English colleagues have always held the name of Liautard. America is one of the strongest links in the chain which binds the veterinary allies together at the present time.

Please express through your columns the fact that we of the profession in England greatly deplore the fact that it is inevitable that such men are ever allowed to die, but that we consider the life he led and the results he attained must ever shine as a brilliant example for all other members (whether young or old) of the profession to follow.

Yours sincerely,
FREDERICK HOB DAY, Major.

A VETERINARY POET

*Editor Journal of the American Veterinary Medical Association:
Ithaca, N. Y.*

We have never suspected our old—excuse us, we mean our *long time* (for we are both still on the active list)—friend, Major Gerald E. Griffin, U. S. Army Veterinary Service, of being a poet. We have eaten and —— (deleted by the Censor) with him in this and other countries, and enjoyed his wit and blarney for lo these many years. We always thought a poet wore long hair. We are sure the Major is shy on this point, but external appearances are likely to be misleading.

“Ballads of the Regiment”* is a song of the old army and the frontier post, the camp and trail by one who knows them from long years of experience. We can see the troopers as they swing away over the buffalo grass and hear the rhythmic beat of hoofs, the creak of saddle leather, and can smell the sweating horses. After a long day’s ride and “chow” while the cool night shadows are gathering we will light our pipes and sit by the camp-fire out of the wood smoke, and listen.

INSPECTED AND CONDEMNED

“Here’s your horse,” cried the auctioneer,
(A trooper led him in)
“He’s strong and sound, a worker, too,
Clean as a new-made pin.
What am I bid to start him off?
(The crowd jeered where it sat.)
Twelve dollars bid! Twelve twenty-five!
Who’ll make it thirteen flat?”

A dark brown gelding, fifteen two,
Just rising eighteen year.
A star and snip, the right hind white;
Wire scar behind the ear.
U. S. I. C. burnt on near arm;
C. 5 upon near thigh,
A bullet’s mark across the breast,
Received in years gone by.

I choke, my thoughts fly through the years,
To days of long ago,
With “C” troop camping near the streams
Fed by the mountain snow,
The carbine’s crack. The savage yell.
To horse! The troopers cheer.
The flying “clouts”. The saber’s flash.
I charge on “Carbineer”.

*The Geo. U. Harvey Publishing Co., New York. Price \$1.00.

'Tis but a horse, a small brown horse,
Why should I grieve or care?
He served with me for twelve long years
That flag you see up there.
Companion of the camp and trail,
True friend who knew no fear;
To save him from an unkind hand
I'd die for "Carbineer".

Major, we are not going to violate these new fangled army regulations by asking you to "nominate yer pizen", so we'll simply say, may you live long, write many more ballads, and prosper.
Here's How! MAYO.

NECROLOGY

GEORGE H. DUNN

Dr. George H. Dunn, a graduate of the Ontario Veterinary College of the class of 1894, died at Pittsburgh, Pa., July 2, 1918, of sarcomatosis of the intestines, at the age of 53. He formerly enjoyed a large horse practice, but of late years had specialized in canine and feline practice.

MISCELLANEOUS

—Dr. Frank C. McCurdy has removed from Buffalo, N. Y., to Baltimore, Md., in the federal meat inspection service.

—Dr. Howard S. Miller has left Buffalo and joined the federal force at Richmond, Va., in the eradication of tuberculosis.

—Dr. Otto E. Jung has transferred to Little Rock, Ark., to engage in hog cholera control work conducted by the B. A. I. in cooperation with the State of Arkansas.

—Dr. Sid Galt has been assigned to tick eradication work at Fort Worth, Texas, as assistant to the inspector in charge.

—Veterinary Inspector D. S. Otey has been transferred from meat inspection at Waterloo, Ia., to field work in hog cholera control with the force of Dr. J. P. O'Connor at Poteau, Okla.

—Dr. F. L. Cusack has removed from Carrington to Wimbledon, North Dakota.

—Dr. W. R. Lee, formerly at Chicago, Ill., is now at Columbus, Nebraska.

—Dr. C. L. Moles, formerly with the B. A. I. at Cedar Rapids, Ia., is now located for practice at Central City, Ia.

—Dr. J. F. Shigley, formerly at Kenmare, N. D., is now with the Beebe Laboratories at St. Paul, Minn.

—Instructions have been issued by the Bureau of Animal Industry for the transfer, effective August 1, 1918, of Dr. A. W. Swedberg from Omaha, Neb., to Denver, Colo.

—Dr. John W. Hermann has transferred to Grove City, Pa., where he will engage in tuberculosis eradication under direction of the B. A. I.

—Dr. William Grimes of Paterson, N. J., has exchanged places in the federal meat inspection service with Dr. George N. Suits of New York City.

—In a recent hearing relative to unsatisfactory meat sold the Government by Wilson & Co., Dr. A. Eichhorn of Pearl River, N. Y., appeared as one of the witnesses for the defense. Dr. Eichhorn explained the meaning of "stale" meat and "moldy" meat. "Mold"—a vegetable growth—did not mean that meat upon which it appeared was unfit for consumption. It may easily be removed with a mixture of vinegar and water, and did not spoil the meat. "Stale" meat was not so "lively" as fresh meat, but was in no way inferior, the nutritive value being unaffected, thus it was good for human consumption. Dr. Eichhorn did not change his testimony under cross examination by the Government's counsel.

—Dr. Archibald R. Ward, late of the Bureau of Animal Industry stationed at Washington, has severed his connections with the Maryland State College of Agriculture at College Park, Md., to assume the duties of Director of the Veterinary Biological Laboratories of the H. K. Mulford Co., at Glenolden, Pa.

—Dr. W. L. Williams of the N. Y. State Veterinary College at Cornell University, visited British Columbia in June to initiate treatment of cattle at the Provincial Government Farm in connection with contagious abortion. He also met the members of the B. C. Veterinary Association, conducted a clinic and gave a lecture upon the cause and treatment of the disease. Dr. Carl Cozier Bellingham, Wash., secretary of the Washington State Association, was also in attendance. A banquet was given by the B. C. Veterinary Association in honor of Dr. Williams at the Hotel Vancouver

with President S. F. Tolmie, M. P., in the chair. Appropriate toasts were made and responded to and Dr. Tolmie outlined the nature of the proposed Veterinary Advisory Board for Canada. The members freely expressed their thanks to Dr. Williams for the services he had rendered.

—Among the names for promotion and appointments in the Most Distinguished Order of Saint Michael and Saint George for services rendered in connection with the war, on the occasion of his Majesty's Birthday, is the name of Major Frederick Hobday to be an Additional Member of the Third Class, or Companion of the said Most Distinguished Order.

—Dr. G. E. Koch has removed from Toronto, Ont., to Ardenode, Alberta.

—Dr. L. F. Ross, formerly of Belpre, O., is at Nashville, Tenn., on influenza control work with Army horses.

—The U. S. Civil Service Commission announces a competitive examination for veterinarians, men only, on Aug. 21. Vacancies in the Bureau of Animal Industry, at an entrance salary of \$1500 per year, will be filled from this examination.

—Dr. H. M. Martin, formerly of York, Pa., is now associated with the Animal Pathology and Hygiene Department, University of Nebraska, Lincoln, Neb.

—CHANGE IN ARMOUR & CO.'S BRANCH HOUSE ORGANIZATION. A number of important changes have been made in the branch house organization, affecting the territories with headquarters at New York City, Jacksonville, Fla., Little Rock, Ark., Dallas, Tex., Spokane, Wash., and San Francisco, Calif. The changes came in the nature of promotions to the various men affected. Mr. U. P. Adams leaves the superintendency of the outlying district of New York to assume the superintendency of the Jacksonville, Fla., territory. Mr. Adams is succeeded by Mr. F. A. Benson, formerly superintendent of the Little Rock district. Mr. Benson will be succeeded by Mr. J. S. Livesay, formerly assistant district superintendent of the Lynchburg, Va., territory.

On the Pacific coast, Mr. Sommer, superintendent of the Spokane territory, has been transferred to San Francisco. Mr. W. B. Spinks will succeed Mr. Sommer at Spokane. Mr. J. E. Hoban, who has been Mr. Spinks' assistant, succeeds Mr. Spinks in the superintendency of the Dallas territory.

—TO PREVENT THE INTRODUCTION AND SPREAD OF COMMUNICABLE DISEASES AMONG LIVESTOCK IN TENNESSEE. It has been determined by the Commissioner of Agriculture and the State Veterinarian that enormous losses among horses and mules are incurred every year as the result of infections from influenza, strangles and their complications, which are highly infectious and contagious diseases. Since these losses affect our horse and mule industry to the extent of lessening our State and National efficiency along agricultural and commercial lines, it is therefore ordered by H. K. Bryson, Commissioner of Agriculture, and M. Jacob, State Veterinarian:

Section 1. That all public stock yards and stables operated for the sale, assembling, feeding and distributing of horses and mules in Tennessee be maintained under sanitary conditions at the expense of the owner, as provided in the following sections:

Section 2. That all portions of public stock yards and stables used for the handling of horses and mules, as set forth in Section 1, be subjected to thorough cleaning and disinfection at least once every week, or oftener if considered necessary by the Federal or authorized State inspectors. The cleaning and disinfection to be conducted as follows:

(a) The original cleaning shall consist in the removal of all manure and litter.

(b) All mangers, watering troughs, racks, etc., shall be properly cleaned before each disinfection.

(c) After the original cleaning and disinfection, the manure in horse and mule pens need not be removed more often than once a month, provided there is applied once a day a new or fresh layer of straw, shavings, sawdust or other acceptable fresh bedding.

(d) The disinfection shall include watering troughs, mangers, buckets, halters, floors, partitions, walls, etc.

(e) The disinfection shall consist in the use of 3 per cent solution Liquor Cresolis Compound or any other recognized disinfectant.

Section 3. That all horses and mules showing symptoms of influenza, strangles or any other infectious and contagious disease shall be immediately isolated to premises or quarters not occupied by healthy horses and mules.

Section 4. That the operation and enforcement of this order shall be under the immediate supervision of the inspectors of the United States Bureau of Animal Industry, the War Department, and the State Department of Agriculture.

H. K. BRYSON, Commissioner of Agriculture.

M. JACOB, State Veterinarian.

—C. W. Clark has removed from Park Falls, Wis., to Ashland, Wis., 117 Front St. W.

AN ACTION TO ENJOIN THE LIVE STOCK SANITARY BOARD FROM DESTROYING CERTAIN MARES INFECTED WITH DOURINE AS DETERMINED BY THE COMPLEMENT-FIXATION TEST. SUPREME COURT OF NORTH DAKOTA.

Syllabus: (1) The court cannot enjoin the carrying out of an order of the Live Stock Sanitary Board for the killing of a mare under the provisions of Section 2686 of the Compiled Laws of 1913, which gives to that board the power "to quarantine any domestic animal which is infected with any such (contagious or infectious) disease or which has been exposed to infection therefrom, and to kill any animal so infected", where no appeal has been taken or review of the decision of the board demanded under the provisions of Section 2686 of the Compiled Laws of 1913, which provides that, "within twenty-four hours thereafter (the notification of the board) its owner or keeper, may file a protest—whereupon an examination of the animal involved shall be made by three experts, etc."

(2) The 5th and 14th amendments of the Federal Constitution and their counterparts in the Constitution of the several states gave no new rights but merely guaranteed the permanence of these already existing.

(3) What is and what is not due process of law depends upon the circumstances and the constitutional provisions which provides for a preliminary court procedure are often held to have no application to statutes which are passed in the exercise of the so-called police power of the state.

(4) Sometimes summary proceedings are necessary and summary abatement of nuisances without judicial procedure was well known to the common law prior to the adoption of the State and Federal Constitutions.

(5) There is no property right in that which is a nuisance and no right of liberty in that which is harmful to the public weal.

(6) The state may interfere with private industry whenever the public welfare demands and in this particular a large measure of discretion is necessarily vested in the legislature to determine not only what the interests of the public require but what measures are necessary for the protection of these interests.

(7) The state may delegate to an administrative board the power to adopt reasonable regulations and to adopt what tests it deems necessary in order to ascertain the existence of a disease. This is not a delegation of legislative power. It merely relates to a procedure in the law's execution.

(8) The finding or adjudication of a Board of Health cannot generally be made conclusive upon the owner as to the fact and existence of the nuisance, or that it comes within the terms of the statute prohibiting it, so as to deny the owner the right to a trial by jury and the recovery of damages, if the property so destroyed

is not, in fact, a nuisance, or does not, in fact, come within the terms of the statute. Summary proceedings, however, may be authorized by the legislature against the thing declared to be a nuisance, and such property may be destroyed without a hearing before a jury provided that the right to the action for damages remains. Due process of law is not violated by such procedure.

(9) Where the statute provides for the destruction of infected animals in the discretion of a live stock sanitary board, but provides that before such destruction the owner may appeal to a board of experts, and the owner neglects to take any such an appeal he cannot in an injunctive proceeding to restrain the destruction of the stock, question the determination of the board as to the fact and existence of the disease.

(10) Where a statute authorizes a public board to quarantine or kill disease infected animals, the determination of which of the two remedies shall be adopted lies within the discretion of the board and cannot in the absence of fraud be controlled by the courts. In all of such matters the only question in which the courts or the juries are concerned is the ultimate question whether the animal was diseased or not, or came within the provisions of the statute.

(11) The so-called complement-fixation test for the detection of the disease known as dourine appears to meet with the approval of the scientists of both the United States and Canada, and the courts will not interfere with the discretion of the Live Stock Sanitary Board in adopting the same, and in ordering horses to be killed, which react thereto, even though it is a chemical test merely and the horses show no physical symptoms of the disease.

(12) Section 2686 of the Compiled Laws of 1913, leaves it to the discretion of the Live Stock Sanitary Board whether horses which are infected with the disease known as dourine shall be killed or isolated, and the courts will not interfere with or seek to control such discretion.

(13) The fact that the disease known as dourine can only be communicated in the act of breeding and that the owners of diseased mares offer to isolate the same and give bonds that they shall not be bred does not prevent the Live Stock Sanitary Board from ordering their destruction.

—Malcolm J. Harkins has removed from Glenolden, Pa., to Conshohocken, Pa.

—Dr. H. M. Hamilton of Paris, Ky., has reported for service in the Veterinary Reserve Corps at Camp Greenleaf, Ga. Upon his departure from Paris a banquet was given in his behalf at which a gold wrist watch was presented to him.

